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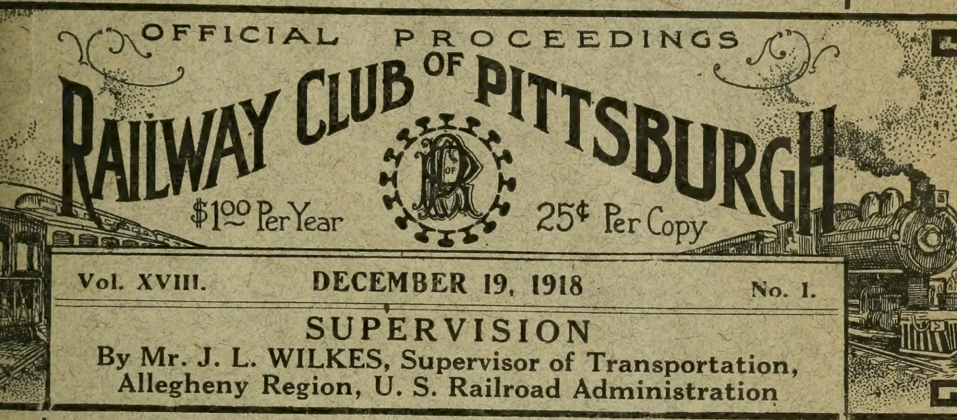

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By Mr. J. L. WILKES, Supervisor of Transportation,
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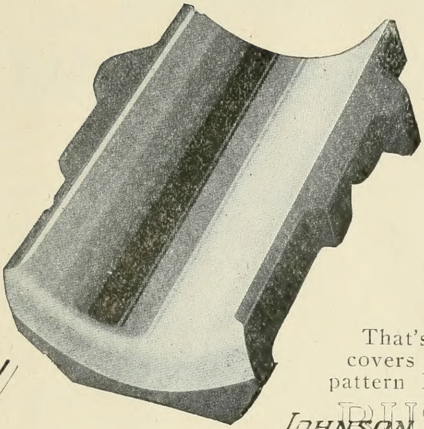

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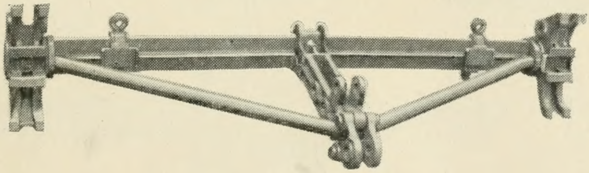

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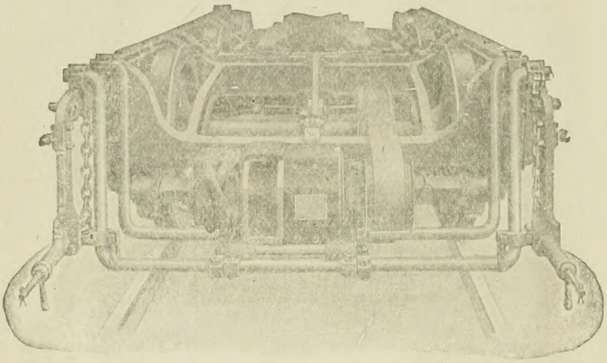

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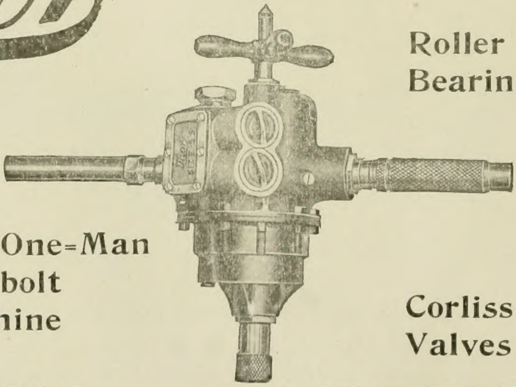

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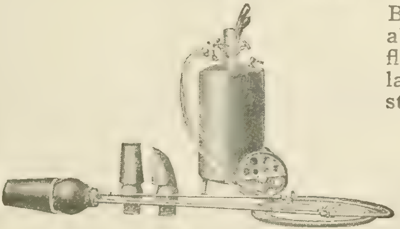

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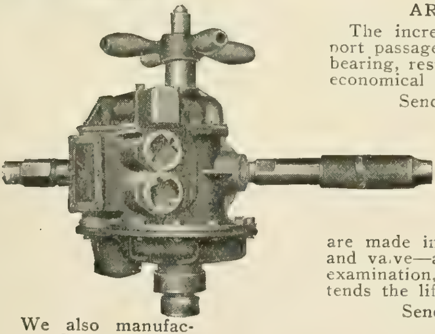

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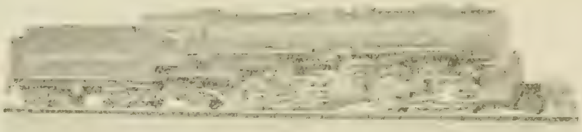

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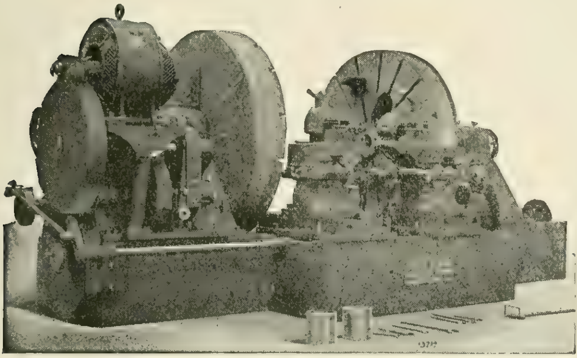

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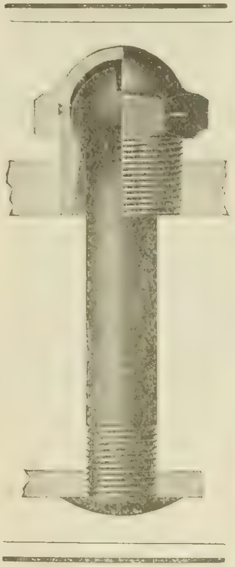

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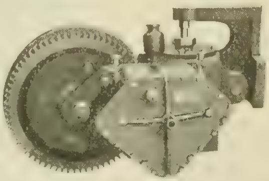

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RAILWAY CLUB NOTES.

The following subjects were presented and discussed by the several Railway Clubs during the month of November, 1918, as noted below:

New York Railroad Club, Harry D. Vought, Secretary,
95 Liberty Street, New York, N. Y.

Subject—"Work Done by Our Railroad Forces in France During the Late World War" by Col. H. Z. Booz and Lt. Commander Dexter C. Buell.

New England Railroad Club, Wm. E. Cade, Jr., Secretary,
683 Atlantic Avenue, Boston, Mass.

Subject—Not received.

Canadian Railway Club, James Powell, Secretary,
P. O. Box 7, St. Lambert, near Montreal, Can.

Subject—"Car Trucks" by Mr. L. Brown, Supervisor, Angus Car Shops, Canadian Pacific Railway, Montreal.

Richmond Railway Club, F. O. Robinson, Secretary, Richmond, Va.

Subject—Meetings suspended during the war.

St. Louis Railway Club, B. W. Frauenthal, Secretary,
Union Station, St. Louis, Mo.

Subject—"Railway Operation in War Time" by Carl R. Gray, Director Division Operation, U. S. Railroad Administration, Washington, D. C.

Southern & South Western Railway Club, A. J. Merrill, Secretary,
Box 1205, Atlanta, Ga.

Subject—Not received.

Central Railway Club, Buffalo, N. Y., Harry D. Vought, Secretary,
95 Liberty Street, New York, N. Y.

Subject—"Conservation of Fuel, Its Present and Future Necessity, and the Big Problem This Involves" by Mr. V. C. Randolph, of New York, Assistant Supervisor, Eastern Region, Fuel Conservation Section, U. S. R. R. Administration.

Pacific Railway Club, William S. Wollner, Editor,
64 Pine Street, San Francisco, Cal.

Subject—"The Season's Greetings."

The Railway Club of Pittsburgh, J. D. Conway, Secretary,
515 Grandview Avenue, Pittsburgh, Pa.

Subject—"Supervision" by Mr. J. L. Wilkes, Supervisor of Transportation, Allegheny Region, United States Railroad Administration.

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Pittsburgh, Pa., Dec. 19, 1918

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A. G. MITCHELL	November, 1912, to October, 1914.
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J. G. CODE	November, 1916, to October, 1917
D. M. HOWE	November, 1917, to November, 1918.

* Deceased.

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BRASHEAR, DR. JOHN A., 1954 Perrysville Avenue, N. S., Pittsburgh, Pa. (National Research Council, U. S. A.)

BROWNSCOMB, G. J., Clerk, Union R. R. Co., East Pittsburgh, Pa. (Canadian Regiment, overseas.)

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KATZIN, WILLIAM, Draftsman, Pressed Steel Car Company, 701 Broadway, McKees Rocks, Pa. (Private, Company E., 319th Infantry, Camp Lee, Va.)

LINDNER, W. C., Foreman Car Repairs, Penna. R. R., 2125 Union Avenue, Altoona, Pa. (Captain, E. O. R. C. 35th Engineers (Railway) Camp Grant, Ill.)

LOCKWOOD, CHAS. H., Draftsman, Pressed Steel Car Co., 366 Lincoln Avenue, Bellevue, Pa. (Second Lieutenant, 7th Battalion, Infantry Replacement Camp, Camp Lee, Va.)

MASON, R. L., Railway Material, Pittsburgh, Pa. (Y. M. C. A. work in France.)

MAXFIELD, H. H., Supt. Motive Power, Penna. R. R., Pennsylvania Station, New York, N. Y (Colonel, 19th U. S. Engineers (Railway) American Expeditionary Forces.)

MORRIS, H. W., Purchasing Agent, Pittsburgh & West Virginia Railway, 115 Belmont Avenue, Crafton, Pa. (First Lieutenant, Ordnance Department, Production Section, Carriage Division.)

MORRIS, J. M., Assistant Master Mechanic, Penna. R. R., Verona, Pa. (First Lieutenant, E. O. R. C., 35th Engineers (Railway) Camp Grant, Ill.)

MURPHY, PAUL F., Civil Engineer, Penna. R. R., Aspinwall, Pa. (First Class Machinist Mate, Naval Reserves, 2nd Naval District, Newport, R. I.)

RAMBO, R. E., Civil Engineer, P. R. R., Pittsburgh, Pa. (223d Squadron, Aviation Camp, Waco, Texas.)

RICHERS, G. J., Assistant Master Mechanic, Penna. R. R., Verona, Pa. (First Lieutenant, Headquarters Detachment, 15th U. S. Engineers, American Expeditionary Forces.)

ROBBINS, F. S., Assistant Master Mechanic, Penna. R. R., 28th Street, Pittsburgh, Pa. (Captain, 19th U. S. Engineers (Railway) American Expeditionary Forces.)

SMITH, CHANDLER P., General Manager, P. L. & W. R. R., Lisbon, Ohio. (First Lieutenant, Company 3, E. O. R. T. C. Engineers.)

STORRS, CHARLES P., Manager, R. R. Dept., Storrs Mica Co., Owego, N. Y. (Lieutenant, U. S. Navy.)

STRAUB, V. V., Salesman, Star Brass Manufacturing Co., 104 E. Dedham Street, Boston, Mass. (Private, Signal Corps, School for Officers, Camp Kelly, Texas.)

WHITMAN, E. B., Assistant Road Foreman of Engines, Penna. R. R., Pittsburgh, Pa. (Captain, 19th U. S. Engineers (Railway) American Expeditionary Forces.)

WILLIAMS, HAROLD S., Stenographer, Pressed Steel Car Co., 99 South Grant Street, Bellevue, Pa. (Private, 35th Engineers (Railway) Camp Grant, Ill.)

WIPPERMAN, F. B., Traveling Engineer, Ohio Injector Co., 1437 Monadnock Block, Chicago, Ill. (First Lieutenant, E. O. R. C., Company B, 311th Engineers, Camp Grant, Ill.)

NOTE—In order to keep the above Roll of Honor correct to date the Secretary will be glad to be advised of any additions or corrections thereto.

PROCEEDINGS OF MEETING

DECEMBER 19, 1918

The meeting was called to order in the auditorium of the Colonial-Annex Hotel at 8 o'clock, P. M., with President Spielmann in the chair.

The following gentlemen registered:

MEMBERS.

Kindle, W. F.
Lawson, A. F.
Lent, John F.
Linhart, Walter
Lobez, P. L.
Marshall, W. T.
Matchett, H. K.
Millar, C. W.
Monks, J. J.
Moore, D. O.
McDowell, D. W.
McNulty, F. M.
O'Connor, M.
Orchard, Chas.
Parke, F. H.
Proven, John
Rankin, B. B.
Redding, D. J.
Reed, E. V.
Robeck, G. B.
Seibert, Wm. L.
Smith, John B.
Smith, John L.
Snyder, Jos.
Snyder, W. H.
Spencer, R. L.
Spielmann, J. A.
Stark, F. H.
Stucki, A.
Tegan, Geo. F.
Townsend, J. F.
Turner, L. H.
Adams, L.
Alexander, J. R.
Amsbary, D. H.
Anderson, A. E.
Babcock, F. H.
Barth, J. W.
Beltz, J. D.
Berg, K.
Bowden, T. C.
Burket, C. W.
Christy, F. X.
Code, J. G.
Courtney, D. C.
Daly, P. J.
Dambach, C. O.
DeVore, Harry T.
Emery, E.
Frey, A. R.
Gobrecht, J. C.
Grewe, H. F.
Gross, C. H.
Grove, S. J.
Hepburn, M. J.
Hoffstot, Henry P.
Howe, D. M.
Hudson, W. L.
Johnson, E. A.
Johnson, John F.
Jungbluth, Adolph
Kelly, H. B.
Kelley, H. D.
Kinch, L. E.
Warne, J. C.

VISITORS.

Burel, W. C.
Darrah, C. B.
Gillespie, W. J.
Gorman, J. C.
Jacobs, W. E.
King, Jr., J. W.
Lloyd, J. A.
McLaughlin, Frank
Redding, R. D.
Strome, H. H.
Wilkes, J. L.

PRESIDENT: We will dispense with the roll call, as we have a record of the attendance in the registry cards.

The reading of the minutes will be dispensed with as they are in print. They have not yet been received by the members because the postoffice authorities have sidetracked all periodical mail until they can get out the Christmas soldier mail.

The Secretary read the following list of applications for membership:

Austin, Walter C., Traffic Manager, Carbon Steel Co., Pittsburgh, Pa. Recommended by J. A. Spielmann.

Beattie, J. A., General Superintendent, McKeesport Con. R. R. Co., Frick Building, Pittsburgh, Pa. Recommended by J. A. Spielmann.

Beckert, F. F., Chief Engineer, McKeesport Tin Plate Co., McKeesport, Pa. Recommended by D. H. Amsbary.

Brant, Wm. J., Wm. J. Brant, 1001 Bessemer Building, Pittsburgh, Pa. Recommended by Robert L. Spencer.

Carroll, W. J., Train Master, B. & O. R. R. Co., 3011 Zephyr Avenue, 20th Ward, Pittsburgh, Pa. Recommended by W. H. Collins.

Cunningham, Paul M., Jr., Engineer, U. S. Engineers, 258 Dravo Avenue, Beaver, Pa. Recommended by J. E. Haynes.

Griffin, John J., Shipping Clerk, American Foundry and Construction Co., 4700 Second Avenue, Pittsburgh, Pa. Recommended by J. A. Spielmann.

Harris, J. P., Chief Clerk, Division Engineer, B. & O. R. R. Co., No. 9, Wellington Apartments, Mt. Washington, Pittsburgh, Pa. Recommended by J. A. Spielmann.

Keegan, J. F., General Superintendent, B. & O. R. R. Co., Pittsburgh, Pa. Recommended by J. A. Spielmann.

Klingelhofer, Chas. T., Traffic Clerk, American Foundry and Car Co., 4700 Second Avenue, Pittsburgh, Pa. Recommended by J. A. Spielmann.

Lloyd, J. A., Chief Clerk to Superintendent, B. & O. R. R. Co., 141 Jucunda Street, Mt. Oliver Station, Pittsburgh, Pa. Recommended by J. D. Beltz.

Malone, Frank B., Special Duty man, P. R. R. Co., Pittsburgh Division, 285, Forty-fifth Street, Pittsburgh, Pa. Recommended by W. H. Collins.

Menert, Henry J., General Foreman, B. & O. R. R. Co., 623 Penn Street, Sharpsburg, Pa. Recommended by W. H. Collins.

Miller, Byron, Car Foreman, Bessemer & Lake Erie R. R. Co., Unity, Pa. Recommended by C. O. Dambach.

Morton, Eugene J., Stenographer, Penna. Lines West, 1002 Penna. Station, Pittsburgh, Pa. Recommended by P. F. Smith, Jr.

McCabe, David G., Supervising Agent, Penna. R. R. Co., 1641 Shady Avenue, E. E., Pittsburgh, Pa. Recommended by W. L. Hudson.

McCloskey, J. C., Clerk, Union R. R. Co., East Pittsburgh, Pa. Recommended by C. O. Dambach.

McElheny, M. L., Train Master, B. & O. R. R. Co., 4747 Monongahela Street, Pittsburgh, Pa. Recommended by J. A. Spielmann.

Roberts, Thomas A., Assistant Superintendent, Pittsburgh Division, Penna. R. R. Co., 505 S. Negley Avenue, Pittsburgh, Pa. Recommended by W. L. Hudson.

Schmoll, George A., Division, S. M. P., B. & O. R. R. Co., B. & O. Station, Pittsburgh, Pa. Recommended by J. A. Spielmann.

Smallwood, B., R. F. of E., B. & O. R. R. Co., Hazelwood, Pa. Recommended by C. D. Grow.

Strome, H. H., Assistant Chief Clerk to Superintendent, B. & O. R. R. Co., 133 Hazelwood Avenue, Pittsburgh, Pa. Recommended by J. D. Beltz.

Sturmer, G. W., Supervisor, Tools and Train Supplies, B. & O. R. R. Co., 2830 Parkwood Avenue, Baltimore, Md. Recommended by C. O. Dambach.

Thompson, A. W., Federal Manager, U. S. Railroad Administration, B. & O. R. R. Co., Baltimore, Md. Recommended by J. A. Spielmann.

Ward, W. E., Chief Clerk to General Superintendent, B. & O. R. R. Co., B. & O. Depot, Pittsburgh, Pa. Recommended by J. A. Spielmann.

Wheeler, M. A., Clerk, Penna. R. R. Co., 122 Allen Avenue, Pittsburgh, Pa. Recommended by W. L. Hudson.

Wilson, D. L., Inspector of Transportation, P. & L. E. R. R. Co., 321 Russellwood Avenue, McKees Rocks, Pa. Recommended by C. W. Alleman.

Wilson, R. S., Car Distributor, Union R. R. Co., 2013 Hampton Street, Swissvale, Pa. Recommended by C. O. Dambach.

PRESIDENT: As soon as these applications have been approved by the Executive Committee the gentlemen will become members without further action than the payment of one year's dues.

The Secretary announced the death today of Mr. J. W. Henderson, Chief Smoke Inspector of the City of Pittsburgh and a member of this Club, from pneumonia.

PRESIDENT: A suitable memorial minute will appear in the next issue of the Proceedings.

There being no further business, the paper of the evening will be presented by Mr. J. L. Wilkes, Supervisor of Transportation, Allegheny Region, United States Railroad Administration, on Supervision Operative Department.

SUPERVISION

By Mr. J. L. Wilkes,

Supervisor of Transportation, Allegheny Region, United States Railroad Administration.

The plunging of our great nation in the world war instantly taxed our railroads to the utmost, and threw upon our official family and the rank and file, the greatest responsibility they had ever been called upon to face. It also gave us our opportunity to serve the cause of our country as effectively as any combatant branch of its service, by furnishing the indispensable transportation necessary to the winning of the war.

The terrible conflict is now ended and we may look back with a degree of satisfaction upon our achievements, as a whole, and with a feeling that we have come through the most trying ordeal any railroads were ever subjected to, with a minimum of errors and mistakes of judgment, to apologize for.

But what of the immediate future? Can we permit ourselves to relax, or feel the time has come for rest? Does the end of the war mean a great reduction in business to be handled? Does our present situation justify our thinking we have an operating efficiency which permits us to slow up in our efforts to get better results? What do the reconstruction days have in store for us? What do the accomplishments of the current year teach us of the possibilities of the future? Do we really believe, in our own consciences, that our efforts have always been consistent, systematized, co-operative, intelligently applied? Or have they at times been misdirected to the very detriment of the ends we desired to gain? If business is reduced is it not more imperative than ever to increase our efficiency? And if it increases or remains as it is, can we not make our efforts in peace excel the accomplishments during the tremendous pressure of war?

With the enemy disposed of, and return to normal conditions begun, it is now the time to search ourselves as Supervising Officers. It is the patriotic duty of every railroad man, from the highest to the lowest, to assist the nation by his counsel, if sought, and good work especially in making a proper decision of the great problem now confronting it, as to what to do with the railroads. It is probably the biggest and most complex of any of our reconstruction problems. The maelstrom of war has impressed upon the American people the vital need of keeping all its transportation facilities in a high state of efficiency, and has effectually convinced the nation that this cannot be done unless sufficient sustenance is provided them. But will our people be satisfied with wasteful or misdirected management of those agencies whose sustaining resources it is to provide? Will we not be required to give an accounting of our stewardship, and will we be able to show that we have given the very utmost of return for the sustenance given the roads, as public carriers?

Gentlemen, to my mind, we can show just that, when we have satisfied ourselves that our supervision is efficient—and is in reality SUPER-vision. This word we hear each day, but have we given thought to its make-up, its import? We know "vision" is "to see," "something seen," while "Super-" means "beyond or greater or superior," hence one charged with supervision must of necessity have superior or keener wisdom or vision than those he supervises. He should be able to see more with his greater vision, than the man with average vision. He must from the very nature of his place as leader, and superior knowledge it demands, prepare and instruct those of average vision to attain the greater vision, the complete understanding of how and when to do his work to attain the results desired. He must of necessity be conversant with the work required of his subordinates, so that he may intelligently direct their efforts and energy along preconceived lines, and methods best suited to the ends desired. He must co-ordinate the efforts of those under him to promote harmony and a maximum efficiency, and to do all these he must have acquired himself a superior wisdom and intelligence which qualify him to teach those under his supervision to know how to do their work in the manner desired.

Certainly the rank and file will work only to the standard required; and their supervising officer is that standard, in its last analysis. Can we imagine a successful supervising officer who destroys and shatters the confidence of his personnel? Can we hope for team work, without mutual respect and confidence?

Can we really expect increased efficiency, or even partially satisfactory results, if our supervision is deficient and does not measure up to the superior wisdom its importance demands? Then the very limitation of what each of us may accomplish, is the influence and superiority we may have over the rank and file, and this limit cannot possibly be met, except we have the ability to transmit our knowledge to the men under us, and to render them such sympathetic assistance as will insure their increased interest and co-operation.

What leader of men, or supervisor of organization, can hope to succeed in this day if he be out of tune with the new spirit of consideration, one for another, which is alive in the world at this time? Who, but a just man, forearmed with a complete knowledge of his duties and responsibility, can hope to command respect and support from those who labor under his direction?

Gentlemen, it is not possible to do more with an organization than its supervision demands, and if we permit our initiative and endeavor to become stifled with self-satisfaction or ennui, and persuade ourselves to believe that "our crop is laid by, our work finished for a season," we will just as certainly reap our harvest,—not the one desired but the inevitable inefficiency that has crept in whilst we basked in our self-complacency.

No one man can run a railroad alone—at best he may only help, whether he direct or work in the ranks. Any man may do his work with a simple dignity which elevates. To do one's work with a sincerity of purpose, a devotion to duty well done, a self-determination to meet responsibility to the utmost, together with a wholesome self-respect—such to my mind is real dignity, so let us "play hard, while we play," and do not play as we work, that we may dignify what we set out to accomplish, as an wholesome influence to ourselves, and example to our subordinates.

But we ask, "How are we to know when our supervision is complete?" What evidence as indicating a degree of efficiency which is satisfactory? To my mind the very first essential must be the personal knowledge of every Supervising Officer that he is complete master of the details of his department; that he has sought out each thing needing correction and set a standard by which his men are to be governed and work to; that he has considered the relation of his department to every other department so that the efforts of his department will interlock with the endeavors of the other departments; that a healthy desire to excell is encouraged, but not to the detriment of results in other departments; that he has a wholesome knowledge of the duties and requirements of associated departments sufficient to permit of intelligent co-ordination of effort in all departments; that he has made full effort to instruct his men in the requirements of their duty; that he has encouraged the initiative of his men, and recognized the helpfulness of their co-operation; that firmness in administration is sobered by the knowledge he is right, so that the average employe, knowing such a supervisor is equipped with thorough competency and a just man recognizes and respects him as a leader.

Among the greatest attainments of our nation in the war, was the wonderful strides made by our ship builders. Naturally our people turned to the genius who was responsible as head of this great undertaking, asking how he had accomplished so much, and we shall never forget the reply of Mr. Schwab, who gave the praise to his men, who, as he stated it, "Worked with me, and not for me." Can there be any better test for us now than to apply to our situation that same principal?

Have we as General Officers worked with the various heads of departments next under us, rather than have them work for us? Have we as divisional heads worked with our Assistants, Trainmasters, Master Mechanics, Chief Dispatchers, Division Engineers and other department Supervisors, rather than having them work for us? Have these Officers and those reporting to them worked closely with the men in the rank and file rather than have them work for them? Have we equipped ourselves to know whether our yardmaster, foremen and others in direct charge of the men, are conversant with what we want and how we want it? Have we satisfied ourselves that those we have in charge of the men are qualified for their positions, and if not have we a definite method of qualifying them by example, instructions, educational advice and suggestion? If we have men supervising whom we have satisfied ourselves, after careful tutoring, cannot qualify, or attain the superior knowledge and other qualifications necessary to direct and instruct the men of their departments, have we the moral courage to meet our own responsibility, by removing such a man within the limitation of his ability? Is there any other relief when we have permitted the righteous principle of seniority to override the absolute necessity of general fitness and ability?

From observation and experience it is my opinion the vast majority of railroad men will promptly respond to the efforts and directions of their supervising officer when it is convinced of the ability, sincerity of purpose and a reasonable consideration on the part of such an officer. These qualifications surely beget confidence and respect, and the officer who enjoys such training and characteristics is in a position to demand and receive from his men all of the service he is capable of teaching them to render.

We rarely see two people of the same personal characteristics and by the same token some of our most successful operating officers have achieved splendid efficiency in their work by using different methods. However, in every such career, one thing plainly asserts itself, and that is the wonderful loyalty and co-operation his genius has exacted from his men. Who among us but holds some one above us worthy of emulation?

Does the importance of our influence and example weigh heavily enough with us? Certainly we should not forget that the ranks now hold some of the officials of this and the coming generation and to some one each of us may have been chosen as an example.

So it is not practicable to set down hard and fast rules to govern supervision—it seems to me—but there are many splendid things which should be in keeping with any individual's ideas or preferential methods.

There must be harmony among our official family—nothing is more productive of inefficiency than ill-feeling, jealousy and lack of confidence among men whose duties are to jointly accomplish a given end. For this purpose, it is well to get our staff together periodically, so that matters of common interest and endeavor may be discussed and full latitude given to encouraging joint consideration of questions proving vexatious to proper results in certain departments. These meetings tend to keep the staff better acquainted with each member's department situation, and enable the superior officer to put before each member of his staff jointly, by word of mouth, his desires as to policies and plans of procedure rather than having to use a multiplication of written instructions. Also it affords the opportunity to point out to those in charge of certain work just the accomplishment for the past period, its comparative features, and just what should be done to correct deficiencies or bring about more satisfactory performance.

We must make proper check of the work of our subordinates to insure that methods prescribed are being followed. Each subordinate officer should be given the authority he requires and be made to understand his responsibility and meet it. Certainly we should be among the rank and file often enough to be known by them, and should know as many of our men as possible, in keeping with proper dignity. A splendid way to find out what is going on is an occasional ride in the cupola and the cab, and if we are to give thorough supervision, we must know all the details of the work in a general way, our men are required to do. These trips give unlimited opportunity to look into the tonnage, to see just what the condition of equipment is, in which the men are required to work—to check up switch and signal lights, to observe flagging performance, to examine caboose equipment, to test out speed regulations, rough handling of train, to get the feeling of the men, in fact just look into everything. Find out from the boys their story as to the cause of overtime, and what we can do to help get them over the line. Overtime is a good thing to substitute for mercury in our Railroad Division Thermometer. As a rule, when overtime goes down, our efficiency is getting better, and those of us who handle overtime should have before us constantly our percentage of overtime to wages—and we should never rest in our efforts to ferret out the avoidable overtime which is not justifiable. Overtime alone gives us one of the very best vehicles for detailed supervision of our yard, and road performances. It takes us to the enginehouse to get the engines out on time. This invariably results in straightening out the roundhouse force and the calling system for engine crews. When the callers give the proper call, the engine crews are seldom late; when the engine comes out on time, the train crew and yard must immediately come across; your train leaves the yard in good shape with every member of the crew in good humor, and ready for a trip. The Yard Master has another track and his work proceeds with a certainty based on sure performance. The airmen are ready for they know when they must be ready. The same applies to the Dispatcher, and he moves the train at once. With the same fidelity the overtime shows us where to look for every avoidable delay, as a rule, and if the final terminal holds up the train, someone must defend it.

There is no more important thing in train operation than to supervise minutely the terminal performances, and every man in the Terminal organization should know, from observations of our actions on periodical visits, that the principal details of yard operation are of sufficient importance to demand our personal attention. We should invariably practice, on these visits, looking at bill boxes to see if bills are properly stamped, the length of time loads are held, whether bad order cars are being properly switched to repair points, status of company material, damage to cars in switching, handling of perishables in season, or any condition of local importance to individual points.

Aside from the value to us in personally knowing our situation, such action is of tremendous educational value to yard forces, for it teaches them how to get the same information and avoid the failure incident to improperly handling these features. Then too they know just what standard we have set and that we propose it shall be maintained.

We should set a figure as to what is a normal amount of loading to be on hand in our terminals and yards at a given time, say midnight, and a similar figure for the average movement over different districts and Divisions. Our reports should, therefore, be simple so that we may know at a glance the real situation and performance, that we may immediately follow up anything thereon which begins to deviate from the standard we have set. Our business is to handle cars, whether they be loaded with freight or passengers, and every thought, every energy we expend, and every bit of supervision we are capable of giving, should be to the end of moving this business swiftly, safely and economically.

We should attach the greatest importance to the things common to most yards and terminals which tend to slow up their performances, and our supervision should be such as to keep us satisfied certain fundamental things are not being neglected. No bill cars, hold cars, company material, bad order cars, transfer loads and general nuisance stuff should be segregated when possible, and disposed of promptly. Every such car permitted to mix up in live tracks proves detrimental to yard operations. Bad order cars have been with us always and we sometimes fail to support the car department with satisfactory switching resulting in curtailment as to number repaired and frequently in loss of man power and wages.

Varying seasons of the year usually require that certain classes of equipment be given preference in repair, and we issue such instructions to our car repair forces. But do we make it possible for a compliance with such instructions by seeing that proper switching is given them? Some of the principle failures in handling our bad order cars include letting bad order cars go over humps into live classification tracks, instead of a specified track, mixing bad order loads with empty bad order cars on repair tracks, mixing light repair and heavy repair cars so that when a light is repaired it cannot be moved, placing cars into repair yards late so men cannot go to work on time, lack of close co-operation between yard and car forces so noon pulls may be made where needed, placing wooden cars in steel repair shops and vice versa, where such layouts are available, prompt movement of bad order cars from yard tracks to shop tracks, and repaired cars from repair tracks, prompt handling of transfer loads to designated points for transfer, etc., and our supervision should cover these features. It is my belief the best way to secure the proper handling of these matters is to see our people understand that certain things are required of our car department, and that it cannot meet these requirements unless proper attention is given their work, and for that reason the car foreman should notify the Yard Master in writing each day about 6 P. M., just what cars are desired placed, and where, and he should also advise the Yard Master of the initial and number of each bad order loaded car in the terminals. When bad order loaded cars are not placed on a repair track in 24 hours after shopped, he should notify the yardmaster in person, in 48 hours, the Master Mechanic or Master Car Builder in addition and in 72 hours the Superintendent in addition to those gentlemen. In my opinion a bad order loaded car 72 hours old, either for repair or transfer, should be handled personally by the Superintendent or in his absence, his representative. If this is done, such cars will become rare, and with them go the complaints of delay and hazard which they invite while laying in yard tracks.

It is not sufficient to depend upon our Yard Masters to watch all the details of our terminals, for we must help and encourage by periodical visits, looking into the vital things of operation so completely that not only will we profit ourselves, but will convince the Yard personnel that we know what we want and will see that we get it. We can make no better resolution for the new year than one of self-determination to line up completely the performances of every yard and terminal under our jurisdiction—and then do it.

Under the recent stress of things, we have slipped away from many of our old land-marks and drifted to sea. We have gotten a mania for trying to cure our fall-downs by issuing some new instruction, and as a result we issue too many, and our men observe too few. Closer supervision will reduce the necessity for so many instructions and reports, and it will enable us to get the full value of our necessary reports. Our reports show us with a canny fidelity all our sins of omission, and commission, if we but study them intelligently; and strange to say, they are also our very best and truest boosters, for they never fail to give us credit for every good performance. We must give the compilation of reports attention when inspecting offices, and impress upon everyone the importance of correct handling. Our reports are our couriers from the front lines, and they should be dependable. Therefore, we should never let one get by if it is incomplete or known to be incorrect.

Frequent questioning of subordinates as to vital statistics covered in reports will finally awaken in them an interest which will satisfy us that they are studying the performances of their departments, and the result of this type of supervision will be most gratifying.

The necessity for keeping in close personal touch with the work under us, we often neglect, because of stress of office work and other reasons. Our office can be lined up to permit of outside supervision and inspection, or it may be so handled as to continually keep us grinding. But strange to say, the more we get out and keep in touch with things under our supervision, the less grief we have through correspondence, for then we begin a systematic reduction in the things which are inefficient, and which cause the unnecessary office work.

Most offices nowadays, particularly the larger ones, have reading files so that a copy of every letter written by any clerk or department under one may be at the disposal of such officer, and he should read this file for each day. His trained eye will soon enable him to pick out instantly the letters which merit careful attention on his part, so it is not only possible but desirable for a supervising officer to so arrange his office that he may be away for purposes of supervision.

Safety work and Y. M. C. A. branches have been established on nearly all railroads of the country, and the open meetings of both furnish the Operating Officers ideal opportunities to meet many of their men. We should insist on our men coming to Safety meetings, and there is no surer way to encourage them to good work, or to make them realize the sincerity of our interests in their welfare. Your serious consideration is invited to the advisability of having "get-together" meetings with your men immediately after the Safety meetings. At such time we should make plain to them our desire to secure their help to get efficient operation, and call on them openly for suggestions as to what we can do to better operations. The average man delights in being singled out and noticed, and such policy will result in getting many of our men to think, and when we begin to think, we will begin to accomplish. This method will give a Division Superintendent or Train Master more information as to occurrences in general than anything within my knowledge in a given length of time, and if we will seek this information, give it careful study, and above all fix the things which are wrong, if possible, our men will immediately place us in the class of "Doers"; and we will instantly get a co-operation which no man need be ashamed of.

Often we Supervising Officers think some one above us is severely critical, when if we really knew the estimate which is passed on us in the sandhouse, we would wonder why we live. Don't let us deceive ourselves that a single man, from the enginewiper to the rest below us, does not know when things are bad in operation, and who is the man to correct them. There is not a one of them but is enjoying "Watchful waiting" to see if we are going to fix them ,and not one of them but will, in his inmost soul, be pleased when they see us make the start. There is surely inborn in the breast of every railroad man a fixed admiration for a boss who does things, and with it an unfailing loyalty if the boss lets it be known that his men are due some of the credit.

We probably have more new men in railroad service today than at any time in history, and the need for educational work is increasingly imperative. We should assure ourselves that our new employes in every department are being given suffiicient instruction to enable them to be of value. It is difficult for the old employe to recall the many days he put in cubbing to equip himself for a job on the railroad, and for some peculiar reason they have not the patience to give the stranger in the ranks the same consideration he was given as a cub. We must frequently remind them that the helpfulness of these new employes depends upon the promptness and correctness of his instruction.

One old difficulty, low wages, has gone, and we may now turn to our Supervision with a reasonable feeling of certainty that we will have the same men tomorrow that we have today, hence we may build our forces up to the efficiency which our new wage level justifies, and we must so supervise it that we receive an hour's work for every hour's pay.

But gentlemen, it would ill become me to attempt to set forth a specific type of supervision or correction for every ill or condition existing on our railroads today, rather would it be better to ask you to join me in an old-fashioned revival of spirit in which to meet the New Year's possibilities. The past two years have been so ripe in new experience and so abundant in surprises, we may well wonder what the New Year holds, and in any event, we will be prepared for every call upon us, if we are resolved to strengthen our ability to supervise by constant study and ceaseless diligence based on our realization that there is nothing wrong in our operation which is too small for the very highest among us to fix, and on our determination that we will train ourselves to know what we see when we see it, and fix what we know that we see. Let us make every consistent effort to broaden our methods, to exercise our brains to devise some new or cunning means of getting a closer hold upon our men, to the end that we all may cling closer to the tried and proven standards of the past, and to a more perfect observance of our rules, regulations and standard practices.

Never in our lives have we been offered so much latitude or power in the exercise of our authority, never has individuality, personality and initiative had a greater opportunity to assert itself, then we are now enjoying, for the whole nation has its eyes upon us to see whether our brains have been shackled in the past, and it is saying to us all from the highest, down to lowest, "Now you have it—Let us see what you are going to do with it?"

So gentlemen, let us embrace this rare opportunity to its fullest by a self-determination on the part of us all to dedicate our efforts for the coming year to a keener, closer supervision, to a full utilization of the co-operative and co-ordinated effort which the existing situation has made possible for us. Supervision is the Aladdin's lamp which will bring our country's roads to the full bloom of efficiency and public benefaction.

Shall we let it be said that there is one among us who is afraid to touch its magic sides? Or who does not know how to bring forth its magic wonders? To no greater task have men ever set themselves, and no greater minds have ever been assembled to a task, so let us enter the New Year with this toast: "To our railroads—we drink to your health with a closer supervision."

PRESIDENT: I think this is one of the best papers we have had read before the Railway Club. It is full of food for thought. We would like to hear discussion of the subject and I will ask Mr. Redding to open the discussion.

D. J. REDDING: While ostensibly Mr. Wilkes has been talking to the transportation men of our Club and we mechanical fellows were into clear, I think every one who has had any supervisory experience in any department of the railroad can learn a great many things by a careful study of what Mr. Wilkes has said. I think we can all agree with him that the man who should make the best supervising officer is the man who knows the work he is going to supervise. There may be cases where a man will be selected for a supervisory position who will possess many qualifications that make for leadership but perhaps has not had opportunity to know all the details of the thing he is going to supervise. We have all observed cases where such men have made very successful supervising officers, sometimes more so than others who have had all the practical knowledge. Because such men must necessarily put into their work the gray matter the Lord has given them to determine how each job should be done, how much time it should take, and to see that it is properly done and in about the right time. To those who have had the opportunity to become conversant through actual experience with the work of the men, this becomes an easy matter, indeed so easy in some cases that the man entirely overlooks many of the vital points to which he should be paying strict attention. He takes things for granted because of their familiarity to him. If he goes along in that spirit in a general way he will lose out eventually, because it is unfortunately the fact that very many men who render service on the roads or anywhere else, have gotten into the habit of feeling that they should render just as little as they can and get away with it. It is unfortunate that such condition exists, but we all know that there is such a condition. We can all look back to the time when the average workman took more pride in his job than he does now, and then the fellow who slacked was looked down upon by his fellows in the same line of work. That means all the greater demand for proper, careful, consistent and continuous supervision. You cannot afford to be satisfied with the performance of this month as compared with the last, but you must make it better.

Another habit mentioned by Mr. Wilkes is that of allowing ourselves to be overwhelmed with mere details, which can be carried by someone else. That is a matter that men should educate themselves away from, and try to train the men underneath them to carry their portion of the load.

Altogether, as the President has said, I think Mr. Wilkes has given us a great deal of food for thought. We cannot carry away with us many of these thoughts but we can refresh our minds from time to time by reading this paper after it has been published in the Proceedings, and derive a great deal of benefit from it.

PRESIDENT: The thought Mr. Redding brought out in regard to reading the Proceedings is a very good one. I would suggest to the members that when they get the Proceedings of this meeting, they read this paper over carefully several times.

We have with us a friend of mine, a former member of this Club, who has been through all sorts of experiences and in several departments of the railroad, and I would like to call upon him, Mr. George Sturmer of Baltimore.

MR. GEORGE W. STURMER: Mr. President and gentlemen of The Railway Club of Pittsburgh: I did not come here to do any talking, I came too listen, and I, have been well repaid. The supervision of railroads today is one of the most effective elements that we can find for progressiveness. You well remember the railroads years ago when supervision was not what it is now. But we have in the last few years absolutely demonstrated to the world that railroad genius has progressed in this country while other countries have stood still. To demonstrate that fact all I have to do is to refer to the battlefields of France. Our engineers went over into France and through their ingenuity we laid old Kaiser Bill in the shade.

Railroads naturally are like any other line of business and the supervision of them depends entirely upon the education you have given the man in charge. As has been said, no one man can run a railroad. It takes all kinds of men to run a railroad. And railroads have been so progressive that I believe we can outrank the whole world, and I believe we have done it. We educated Russia, we educated France, we educated South America, in fact we educated the whole globe. And when it comes down to railroad supervision, every railroad in every foreign clime has taken up the cause of American railroads and by educating their constituents they have brought success.

I am perfectly in harmony with everything that has been said and read by our friend and we invite any criticism he may advance, but it is only fair to this body of railroad intelligence to offer or suggest something that will improve these conditions. Supervision of railroad transportation in America must have been 100 percent in the last year when we were able to move and transport 2,000,000 men across the continent almost without a single mishap—one of the greatest feats ever performed, and this proves beyond a doubt that every man in railroad life co-operated with the other to bring about perfect supervision and help win the war. The war took thousands of our best railroad men, which was a great handicap to perfect supervision, and this again proves that our practical rules on railroad supervision can always be depended on for good results. But there are a thousand and one different minds and different points regarding supervision of railroads. There are a thousand and one different ideas within the mind of a railroad man that have never been yet divulged. But education and co-operation from the track man to the general manager is what brings about supervision in transportation. The fact lies here: Due to the co-operation of the railroad men of America today we have proved it to the world within the last year. Different railroads and different managements have different rules to govern their men. Every general manager has new ideas that he produces to bring about results and to bring about progress. They have gained success where others have failed. Now I have always contended this. No matter what vocation you follow in life as a railroad man, no matter what position you hold, co-operation on the part of you and every employee will bring results, and the hearty co-operation of every man connected with the railroad life brings new ideas. We need more railroads and we need more railroad men, and today according to statistics we have more than 1,750,000 railroad men in the United States. It goes to prove that as a nation they have built up this country.

This organization is instructive and educative. I am glad to hear the list read of those 29 members who have applied for membership in this organization and I am glad to be with you. Every railroad man must be a better railroad man after listening to such a paper as we have had presented here tonight. You have the railroad intelligence of the greatest State in the Union, Pennsylvania, in this Club and there is no reason why you should not have a membership of two thousand if you co-operate with one another and every one does his duty to bring about success. I wish you well. I thank you for calling on me. I hope that the next time I come to Pittsburgh I shall have the opportunity of listening to just as good a paper as the one tonight. I have put in 42 years of railroad life and I feel that I can still learn something. Get busy and get a membership and I will guarantee to you a progressiveness in the railroad life that will be felt in the city of Pittsburgh.

PRESIDENT: Mr. Stark looks as though he had something to say.

MR. F. H. STARK: The speaker of the evening has presented the subject of railroad supervision in a most intelligent and practical manner, emphasizing it with a touch of sympathy which ought to appeal to every man present and those who may read the Proceedings, and it will become valuable data for future reference.

The emergencies during the past year have often been very trying and at times one is apt to be pessimistic, with more or less prejudice as to whether we are operating railroads in the efficient manner as in the past. Yet, when we stop to think that during the past year or two there have been more food stuffs produced, more coal and ore mined and steel manufactured than during any previous like period, and the railroads have transported a greater amount of tonnage with a large percent of inexperienced men, all of which has played an important part in winning the War.

However, to accomplish this transportation feat, the administration has embargoed practically all commodities except war essentials and consequently, we ought to handle a greater amount of segregated tonnage. In the meantime, the physical condition of railroad property has deteriorated and will require time and money to re-establish the former conditions. The speaker has emphasized the need of patience and co-operation in bringing out what is the best in men and educating. This, of course, is acknowledged and yet we often get discouraged because of the little accomplished and the apparent indifference on the part of young men generally. We are aware of the efforts made by railroads and would refer more particularly to the interest taken in the welfare of men by our esteemed D. J. Redding and L. H. Turner, which is an evidence that the railroads have a direct interest in their employees.

In years gone by, it was possible to have a number of understudies who were willing to await their time by keeping sweet and being loyal until promotion was possible, but in this day and age it is difficult to find young men who will remain long enough to become qualified for responsibility and the result is that the available material for advancement is not very encouraging. Let us hope that the material advance in compensation for railroad employees will attract and hold young men and thus re-establish the standing of railroad men as compared with years ago. There are fads and fancies and at times we are encouraged to think that some new condition or change of policy will cure all ills and yet as a matter of fact, the operating of railroads must be on a solid, business-like basis and it is a wise man who observes the trend of the times and shapes his course to meet the new conditions with a fair and open mind, encouraging that which is right and proper and combating with courage that which is wrong. It is important that a conservative course be followed and all concerned will have to yield, for all adjustments must be accompanied by a give and take spirit.

The supervising officer has a difficult task. He must be resourceful and be a good judge of human nature, and not easily discouraged. Then too, if we could, through a process of education, tolerance, etc., re-create all of the railroad men and endow them with supernatural wisdom, we could not operate railroads most efficiently and economically unless proper facilities are provided.

I was in hopes that Mr. Wilkes would tell us how freight congestions in Pittsburgh could be avoided. As a matter of fact, we must have better terminals, which means a tremendous outlay of capital and in many cases it would be almost impossible to accomplish. We need better shop facilities which is not generally fully appreciated. A modern commonsense plant will bring greater returns than increased traffic tonnage. Therefore, the railroads must have not only co-operation between supervising and railroad employees generally, but also the public, and the railroads should be accorded reasonable consideration in order that they may provide adequate facilities.

PRESIDENT: We have with us a gentleman who rather controls some industrial roads from whom we would like to hear, Mr. Townsend.

MR. J. F. TOWNSEND: I am very glad to add my testimony to the excellence of the paper, and also enjoyed the remarks of the gentleman from Baltimore, as well as the old veteran in our midst, Mr. Stark. Suppose I will be classed in with the old fellows. But want to say that there is no question about the benefits to be derived from these gatherings. It was in September that we had the last meeting in this room, and as I remember the President had a great deal to say about less than carload lots, and when every fellow got up he would ask, "How about the less than carloads?" The transportation men appreciate what he was driving at. I confess that when thinking about it when I got home made up my mind that he was on the right track, the question of solving the less than carload lots that do not pay. Any railroad man that has any experience knows that less than carloads do not pay. It is a burden on the railroad. I have suggested what may be a solution, to follow out the plan that has been suggested by Mr. McAdoo's Commission sitting in New York and make store door deliveries. Since we had that meeting, and that suggestion was made, the Railroad Administration has taken over the express companies, and I have felt that here was an agency, with all the trucks and wagons, to deliver the less than carloads as fast as they come in, if the freight business was taken out of the express business, in other words. The government has taken away the cream of the express business through the parcel post and the U. S. registered mail. It is gone for good. What are the express companies doing? They are taking the cream from the railroad freight business, the result is that the railroads in order to provide for the express traffic are not only furnishing cars of the most expensive type, but they only get 50% of the revenue while the express company charges a very high rate for picking the package up at your door or delivering it at your door, and in 80% of this country they do not pick it up at the door or deliver it but they make the charge just the same. Uncle Sam in the parcel post takes it from your door and actually delivers it to the consignee where addressed all over the country.

MR. L. H. TURNER: I am quite sure that most of you are not familiar with the position held by Mr. Wilkes, or the duties he is called upon to perform. His title under the United States Railroad Administration is Supervisor of Operation, which places him in authority over every phase of work in connection with the employment of trains, and he is the only man that I know of, holding a similar position. There were at least 150 other gentlemen holding positions similar to his at the time he was called by the Railroad Administration to accept this work, and it is safe to assume that he was regarded as the most proficient, or else he would not have been selected.

I have good reason to know that he is well equipped to speak upon the subject of "Supervision of Operation," but there is quite a difference between the position of a man who tells you how to get supervision, and that held by the man who has to get the service. Labor organizations today are submitting contracts to be signed by railroad officers, which cover everything in the way of maintenance and operation of a railroad, and they specify that when a position is vacant, that it must be advertised, and the oldest man making application shall be given a test; they very kindly provide that if a man does not qualify, that after the expiration of thirty days, he may be removed, and another of the older men who have applied will be given an opportunity, and so on indefinitely, until the position is either satisfactorily or unsatisfactorily filled. It places a premium on seniority, to the entire exclusion of superior capacity and education. There is no incentive whatever for a young man who has had a good training, to try and fit himself for something better, as the contract makes it necessary for him to become an old man before he can obtain recognition.

This is one of the reasons, and a very important one, why supervision will never improve if any encouragement or authority is given organized labor to select those who shall guide their efforts. This is too important a subject to be dropped after a reading of Mr. Wilkes paper, and the necessarily light discussion it will receive, and personally, I would like to see the discussion carried over until the next meeting, and in the meantime, I think if our President would select a half dozen or more capable men, who are well informed, and have had long years of experience in supervision, to come here prepared to enter into a discussion, setting forth the obstacles that stand in the way of their getting good supervision, and what the conditions will be provided the shop crafts are given the contract they are asking for.

During the past six months, any man in the supervisory positions on the railroads, who desired to carry out his duties in the manner that he knew they should be carried out, had to have the wisdom of Solomon and the patience of Job. I have, on a few occasions, found it necessary to talk pretty sharply to some of our foremen when I knew they were not doing their duty, and they knew they were not. Outwardly, they were reasonably respectful. Inwardly, I knew that they felt that they would like to tell me to "Go to Hell." The spirit of co-operation which we hear talked about so much, and which is so much to be admired, does not exist to the extent that it should. This does not apply altogether to common labor, or the journeyman mechanic, but exists oftentimes in the higher branches of the serivce, and in places where you would not expect to find it, and where it should not be found.

For this and other reasons, I cannot help but think that some little good at least might be accomplished if the subject was well ventilated, and the facts as they really exist were known. In consequence, I hope that our President will accept the suggestion that we have one night on which we will discuss this question thoroughly. Mr. Wilkes came a long way to talk to us tonight, and is giving us time that he would like to employ in other directions. His address has been interesting and instructive, and in consideration for all of his trouble and kindness, I move that we give him a rising vote of thanks.

President called for a rising vote of thanks which was unanimously responded to.

MR. WILKES: I thank you, gentlemen. I know that it is the wish of Mr. Markham that you should understand that his administration is one of helpfulness to you and to every man under your jurisdiction, he does not wish to bring you trouble. And if you will bring your difficulties to either Mr. Markham or Mr. Baldwin or any member of the staff, they are only too anxious to give you all the help they can, regardless of who you are or what your trouble may be. That is the real spirit of the Allegheny Regional officials. We are always at your service.

PRESIDENT: And I wish it understood that this Railway Club offers to Mr. Markham and his staff any assistance that we can give. We believe this is a good place and a good Organization to disseminate any information or any policies that he may wish. You know they send out circulars and nobody reads them but the file clerk and sometimes he doesn't. It is an every day occurrence to call attention to circulars and instructions that have been sent out. Here is a place where they may send word or express any order or policy so that they get it first hand, simply by listening, and it can be discussed. And we wish to offer every assistance within our power.

On Motion Adjourned, 10:15.

J. D. Conway, *Secretary.*

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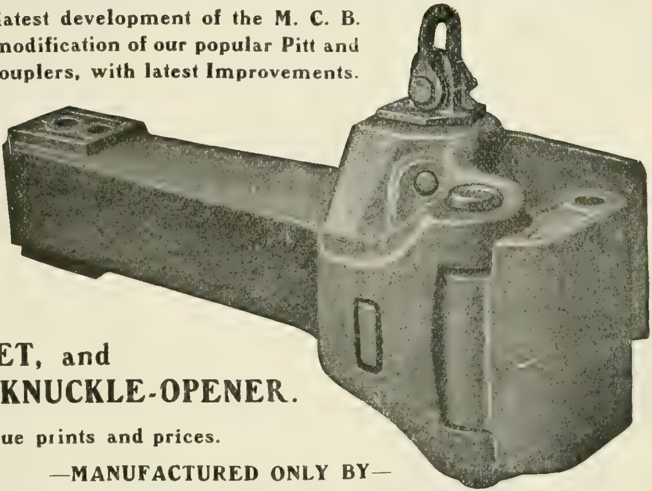

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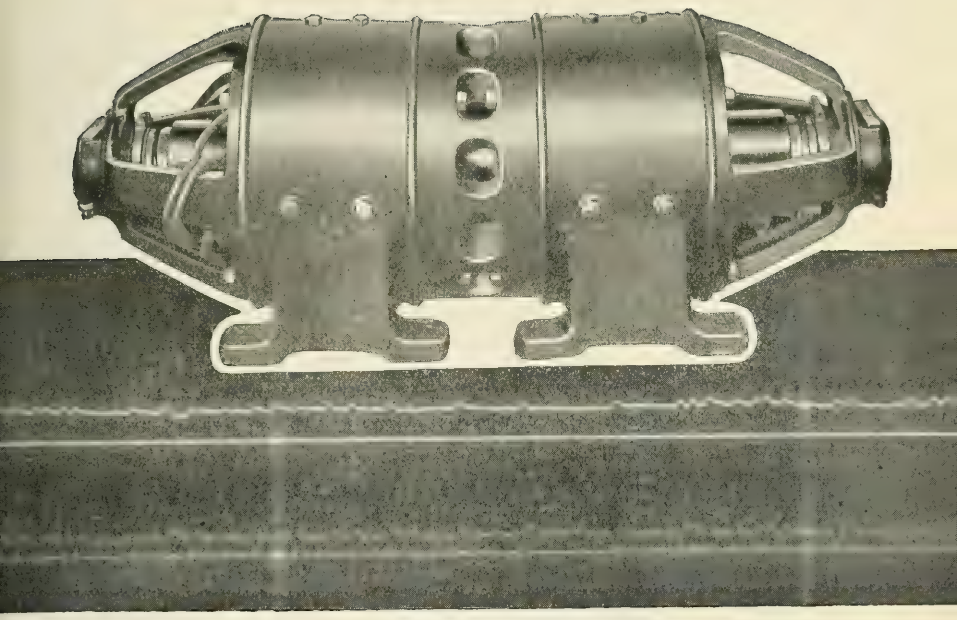

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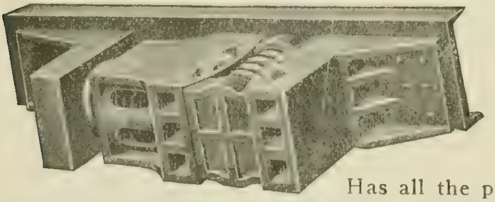

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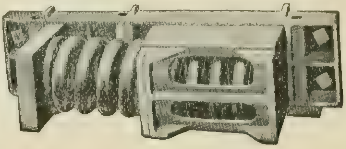

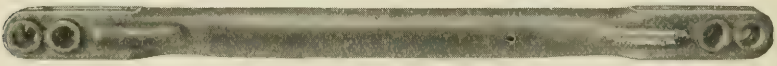

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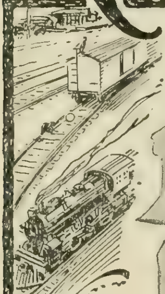

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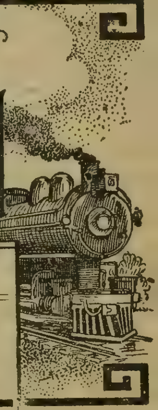

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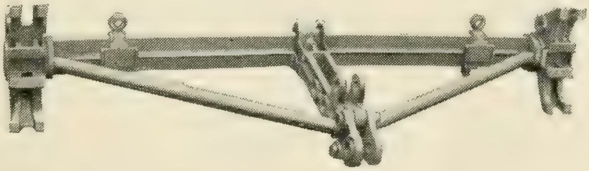

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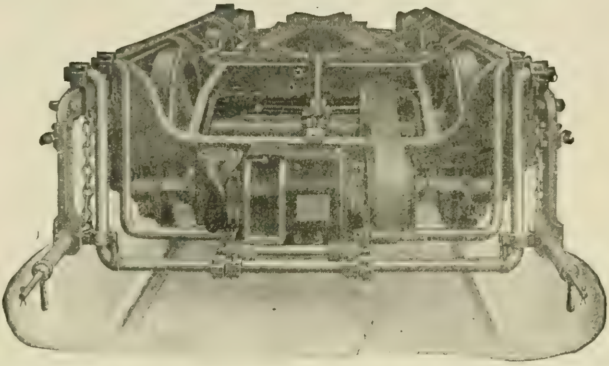

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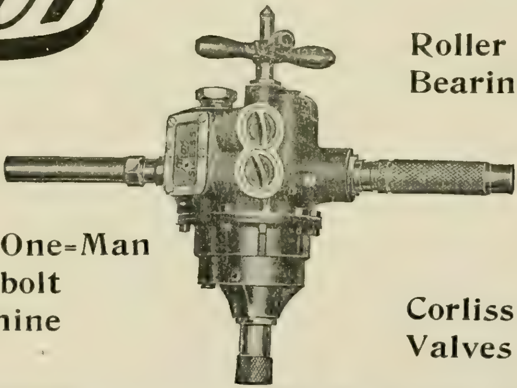

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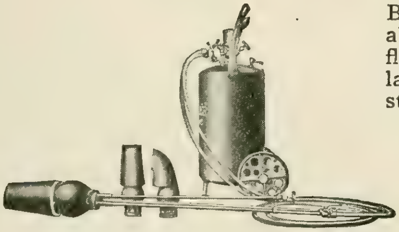

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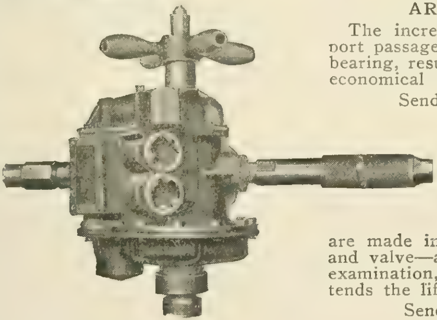

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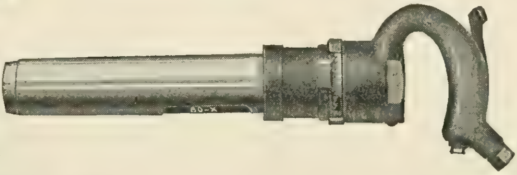

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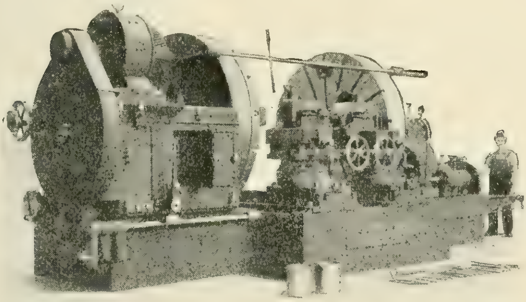

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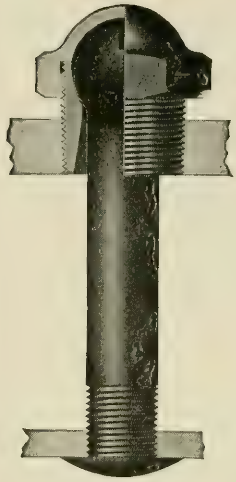

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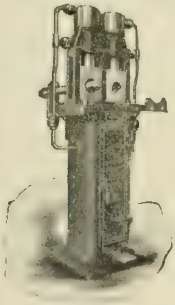

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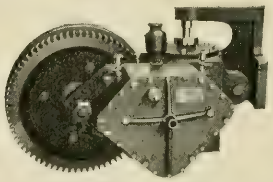

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RAILWAY CLUB NOTES.

The following subjects were presented and discussed by the several Railway Clubs during the month of January, 1919, as noted below:

New York Railroad Club, Harry D. Vought, Secretary,
95 Liberty Street, New York, N. Y.

SUBJECT—"The Future Status of the Railroads," by C. A. Morse.

New England Railroad Club, Wm. E. Cade, Jr., Secretary,
683 Atlantic Avenue, Boston, Mass.

SUBJECT—"The Oxy Acetylene Process in Railroad Shops," by W. L. Bean.

Richmond Railway Club, F. O. Robinson, Secretary,
Richmond, Va.

SUBJECT—Not received.

St. Louis Railway Club, B. W. Frauenthal, Secretary,
Union Station, St. Louis, Mo.

SUBJECT—Not received.

Southern & South Western Railway Club, A. J. Merrill, Secretary,
Box 1205, Atlanta, Ga.

SUBJECT—"Electric Car Lighting," by C. R. Sugg.

Central Railway Club, Buffalo, N. Y., Harry D. Vought, Secretary,
95 Liberty Street, New York, N. Y.

SUBJECT—Not received.

Canadian Railway Club, James Powell, Secretary,
P. O. Box 7, St. Lambert, near Montreal, Can.

SUBJECT—Annual meeting and dinner.

The Railway Club of Pittsburgh, J. D. Conway, Secretary,
515 Grandview Ave., Pittsburgh, Pa.

SUBJECT—"14 inch Naval Guns in France," by Lieut. Commander D. C. Buell, of The U. S. N. R. F.

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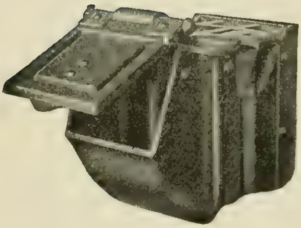

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No. 2.

Pittsburgh, Pa., Jan. 23, 1919

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D. M. HOWE	November, 1917, to November, 1918.

* Deceased.

Meetings held fourth Thursday of each month, except June, July and August.

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MORRIS, H. W., Purchasing Agent, Pittsburgh & West Virginia Railway, 115 Belmont Avenue, Crafton, Pa. (First Lieutenant, Ordnance Department, Production Section, Carriage Division.)

MORRIS, J. M., Assistant Master Mechanic, Penna. R. R., Verona, Pa. (First Lieutenant, E. O. R. C., 35th Engineers (Railway) Camp Grant, Ill.)

MURPHY, PAUL F., Civil Engineer, Penna. R. R., Aspinwall, Pa. (First Class Machinist Mate, Naval Reserves, 2nd Naval District, Newport, R. I.)

RAMBO, R. E., Civil Engineer, P. R. R., Pittsburgh, Pa. (223d Squadron, Aviation Camp, Waco, Texas.)

RICHERS, G. J., Assistant Master Mechanic, Penna. R. R., Verona, Pa. (First Lieutenant, Headquarters Detachment, 15th U. S. Engineers, American Expeditionary Forces.)

ROBBINS, F. S., Assistant Master Mechanic, Penna. R. R., 28th Street, Pittsburgh, Pa. (Captain, 19th U. S. Engineers (Railway) American Expeditionary Forces.)

SMITH, CHANDLER P., General Manager, P. L. & W. R. R., Lisbon, Ohio. (First Lieutenant, Company 3, E. O. R. T. C. Engineers.)

STORRS, CHARLES P., Manager, R. R. Dept., Storrs Mica Co., Owego, N. Y. (Lieutenant, U. S. Navy.)

STRAUB, V. V., Salesman, Star Brass Manufacturing Co., 104 E. Dedham Street, Boston, Mass. (Private, Signal Corps, School for Officers, Camp Kelly, Texas.)

WHITMAN, E. B., Assistant Road Foreman of Engines, Penna. R. R., Pittsburgh, Pa. (Captain, 19th U. S. Engineers (Railway) American Expeditionary Forces.)

WILLIAMS, HAROLD S., Stenographer, Pressed Steel Car Co., 99 South Grant Street, Bellevue, Pa. (Private, 35th Engineers (Railway) Camp Grant, Ill.)

WIPPERMAN, F. B., Traveling Engineer, Ohio Injector Co., 1437 Monadnock Block, Chicago, Ill. (First Lieutenant, E. O. R. C., Company B, 311th Engineers, Camp Grant, Ill.)

NOTE—In order to keep the above Roll of Honor correct to date the Secretary will be glad to be advised of any additions or corrections thereto.

PROCEEDINGS OF MEETING

JANUARY 23, 1919

The meeting was called to order in the Auditorium of the General Forbes Hotel, Pittsburgh, Pa., at 8 o'clock, p. m., with President Spielmann in the chair.

The following gentlemen registered:

MEMBERS.

Adams, L.
Amsbary, D. H.
Anderson, A. E.
Anderson, H. T.
Ayres, W. C.
Babcock, F. H.
Beegel, F. W.
Bell, R. P.
Berg, Karl
Berghane, A. L.
Buckbee, W. A.
Branson, C. R.
Brant, Wm. J.
Braun, O. F.
Brock, Jesse
Buell, D. C.
Buffington, W. P.
Campbell, I. K.
Carroll, F. E.
Cassiday, C. R.
Chalker, A. R.
Chilcoat, H. E.
Christfield, J. G.
Christy, F. X.
Clark, C. C.
Cline, W. A.
Code, J. G.
Conway, J. D.
Copeland, Thos. T.
Courtney, D. C.
Cox, W. C.
Crawford, D. F.
Crenner, J. A.
Cunningham, P. M.
Daly, P. J.
Dambach, C. O.
Douglass, W. N.
Durant, C. H.
Elverson, H. W.
Emery, E.
England, Alexander
Fendner, W. J.
Ferren, R. O.
Finney, H. F.
Flinner, John
Forrest, C. H.
Frey, A. R.
Gale, C. H.
Gallinger, Geo. A.
Gillespie, Wm. J.
Gobrecht, J. C.
Griffin, J. J.
Griffith, J. O.
Gross, C. H.
Grow, C. D.
Harris, J. P.
Haynes, J. E.
Herlihy, J. J.
Hill, J. F.
Hoffman, C. T.
Howat, C. W.
Howe, D. M.
Jahnke, K. W.
Johnson, A. B.
Johnson, J. F.
Jungbluth, A.
Kelly, C. K.
Kelley, H. D.
Keptner, J. B.
Kinch, L. E.

Kindle, W. F.
Kirkpatrick, H. F.
Knox, Wm. J.
Lanahan, F. J.
Lawson, A. F.
Lindstrom, C. A.
Lloyd, J. A.
Lobez, P. L.
Long, R. M.
Lower, N. M.
Mason, Stephen C.
Matchett, H. K.
Mathieson, J. E.
Miller, S. W.
Mitchell, J.
Moore, D. O.
Murtland, De Loss
McConn, G. E.
McConnell, C. H.
McDowell, D. W.
McElheny, M. L.
McFarland, H. L.
McKinstry, C. H.
McNulty, F. M.
Nieman, H. L.
Nordenmalm, H.
Orbin, G. N.
Osterrieder, A. J.
Parke, F. H.
Patterson, J. E.
Pehrson, A. K.
Pfeil, J.
Rabold, W. E.
Ralston, J. A.
Redding, D. J.
Rhoads, G. A.
Richardson, C. A.
Riddile, F. C.
Robeck, G. B.
Runser, K. W.
Schaich, Wm. L.
Searles, E. J.
Severn, A. B.
Sewell, H. B.
Shadek, K. R.
Smith, F. C.
Smith, J. B.
Smith, J. L.
Smith, Jno. L.
Smith, Jr., P. F.
Snyder, J. W.
Sparks, H. D.
Spear, A. E.
Spencer, R. L.
Spielmann, J. A.
Spindler, D. G.
Stauffer, A. H.
Stevenson, Wm.
Streib, J. F.
Stucki, A.
Thomas, C.
Townsend, J. F.
Tutwiler, L. H.
Wampler, J. S.
Ward, W. E.
Warne, J. C.
White, F. L.
Williamson, Jr., J. A.
Wilson, D. L.
Wyke, J. W.
Wilson, W. J.
Wilson, R. S.
Wolf, H. M.

VISITORS

Ahrens, Theo.
Atkinson, J. W.
Baily, J. H.
Balzer, C. E.
Bard, F. N.
Beegle, R. B.
Belsterling, C. S.
Benham, C.
Birch, P.
Bishop, M. G.
Boxall, Q. M. Sgt.
Bowery, F. J.
Breen, J.
Brooks, J. H.
Brown, D. S.
Burleigh, R. C.
Burns, R. C.
Code, C. J.

Colgate, C. A.
Coumis, Gust
Craig, T. S.
Cunningham, H. R.
Darrah, C. B.
Davis, C.
DeCoudres, R. B.
Dobelkan, M.
Dosinger, F. A.
Eicher, L. F.
Fueland, S. F.
Funk, F. W.
Gill, H. T.
Gillinger, C. W.
Gilson, G. I.
Glaseman, W. T.
Goodman, H. F.
Grant, J. H.
Gray, H. H.
Greenough, L. C. D.
Gross, H. A.
Guttormsen, B. G.
Habbus, C. S.
Halleran, H. J.
Halleran, J. L.
Harrison, J. W.
Heineman, W. L.
Heist, A. A.
Hendrickson, S. D.
Hillman, W. T.
Huff, A. B.
Hutchison, H. L.
Innes, H. W.
Johnson, G. T.
Johnston, J. McC.
Jones, Geo.
Jordan, C. F.
Kurcutt, W. D.
Kroegher, E. J.
Ladd, G. T.
Lindsay, G. W.
Linn, F. L.
Linsdam, J. B.
Lutz, L. C.
Maloney, D. A.
Midgley, G. E.
Myers, W. H.
McConnell, P. L.
McMullen, C. E.
Neill, Sgt. Major
Parkin, W. M.
Peters, A. R.
Pickard, S. B.
Pollock, C. E.
Porter, J. L.
Pryver, C. A.
Ridinger, J. L.
Reilley, B. J.
Roberts, S. S.
Rogers, F. D.
Sands, L. E.
Sheridan, P. J.
Sheakley, B. W.
Seubert, H. J.
Sitterle, E.
Smith, Sion B.
Snodgrass, J.
Spousler, W. L.
Stemor, M.
Stork, H. H.
Swift, T. O.
Swift, W. G.
Taylor, C. C.
Terrell, F. A.
Uptegraff, W. D.
Walker, J. W.
Walter, C. P.
Weaver, E. H.
Weiler, G. H.
West, J. W.
Wilson, E. E.
Wright, C. H.
Yvengert, L. C.

PRESIDENT: We will dispense with the roll call as the record of attendance is shown by the registration cards.

The reading of the minutes was dispensed with, the printed proceedings having been already received by the members.

Voluntary contributions were received from the members present amounting to $86.17 and the amount was turned over to the Women's Defense League to be used for the entertainment of sick and disabled soldiers in the United States Hospital at Parkview, Pittsburgh, Pa.

The Secretary read the following list of applications for membership:

Beegle, R. B., Conductor, B. & O. R. R., 210 Elizabeth Street, Pittsburgh, Pa. Recommended by William C. Cox.

Breen, J., Gang Foreman, B. & O. R. R., 214 Courtland Street, Pittsburgh, Pa. Recommended by J. J. Herlihy.

Campbell, J. T., Assistant Terminal Agent, B. & O. R. R., Grant and Water Streets, Pittsburgh, Pa. Recommended by J. A. Spielmann.

Clark, Harvey T., Robert H. Blackall, 1305 Farmers Bank Building, Pittsburgh, Pa. Recommended by E. Emery.

Clemer, H. L., James B. Sipe & Co., Bessemer Building, Pittsburgh, Pa. Recommended by R. E. Rogers.

De Coudres, R. B., Assistant S. M. P., Monongahela Con. R. R. Co., Cleremont and Belcrest Avenues, Carrick, Pa. Recommended by F. M. McNulty.

Fairhead, J. E., General Superintendent, Pittsburgh & West Virginia R. R., Wabash Building, Pittsburgh, Pa. Recommended by C. O. Dambach.

Freeland, S. F., E. H. Foreman, B. & O. R. R., 1820 Chateau Street, Pittsburgh, Pa. Recommended by J. J. Herlihy.

Gibson, D. W., Superintendent American Railway Express Co., 1310 Keenan Building, Pittsburgh, Pa. Recommended by J. A. Spielmann.

Groomes, B. B., Clerk, Union R. R. Co., East Pittsburgh, Pa. Recommended by R. S. Wilson.

Glaseman, W. J., Machine Shop Foreman, B. & O. R. R., 238 Winston Street, Pittsburgh, Pa. Recommended by J. J. Herlihy.

Gordon, Clarance M., Clerk, P. & L. E. R. R., 712 Allegheny Street, New Brighton, Pa. Recommended by B. B. Rankin.

Harrison, J. Wm., Inspector of Ordnance, U. S. N., 318 South Linden Avenue, East End., Pittsburgh, Pa. Recommended by C. W. Howat.

Hillman, William E., Assistant Foreman, P. & L. E. R. R., 1015 Faulkner Street, Pittsburgh, Pa. Recommended by William Stevenson.

Hueston, William F., Auditor, Standard Steel Spring Co., 715 Ferree Street, Coraopolis, Pa. Recommended by J. D. Conway.

Innes, Harry, Pneumatic Work Inspector, P. R. R., Verona, Pa. Recommended by F. X. Christy.

Jennings, A. J., Sales Manager, E. F. Houghton & Co., 501 Manufacturers Building, Pittsburgh, Pa. Recommended by F. M. McNulty.

Jones, George, Boiler Foreman, B. & O. R. R., 605 Hazelwood Avenue, Pittsburgh, Pa. Recommended by J. J. Herlihy.

Jones, P. A., Assistant C. C. to General Superintendent, B. & O. R. R., 128 Bigham Street, Mt. Washington, Pittsburgh, Pa. Recommended by J. A. Spielmann.

Kennedy, J. D., Division Lineman, B. & O. R. R., 4836 Chatsworth Avenue, Pittsburgh, Pa. Recommended by T. H. Robey.

Ladd, George T., Lieutenant Commander, United States N. R. F., President, George T. Ladd Co., 1620 Farmers Bank Building, Pittsburgh, Pa. Recommended by C. A. Lindstrom.

Leet, C. S., Land Agent, B. & L. E. R. R., Union Arcade, Pittsburgh, Pa. Recommended by C. O. Dambach.

Love, J. A., Gen'l Yard Master, Pittsburgh & West Virginia R. R., 331 Rawland Avenue, Carnegie, Pa. Recommended by C. O. Dambach.

Moore, Wayne R., Clerk, Standard Steel Spring Co., 941 Fifth Avenue, Coraopolis, Pa. Recommended by J. D. Conway.

Milroy, W., Safety Inspector, Union R. R. Co., 200 Catherine Street, Duquesne, Pa. Recommended by R. S. Wilson.

Moreland, J. P. S., Tool Attendant, American Locomotive Works, 1326 Marshall Avenue., Pittsburgh, Pa. Recommended by D. C. Courtney.

McConnell, Peter L., Engineer, P. R. R., 179 Home Street, Pittsburgh, Pa. Recommended by F. X. Christy.

McMullen, Clark E., Traveling Car Agent, P. & L. E. R. R., Maple Street Extension, Coraopolis, Pa. Recommended by D. L. Wilson.

Porter, J. L., Gang Foreman, B. & O. R. R., 5311 Second Avenue, Pittsburgh, Pa. Recommended by J. J. Herlihy.

Reilley, B. J., General Foreman, B. & O. R. R., 313 Winston Street, Pittsburgh, Pa. Recommended by J. S. Wampler.

Riley, O. C., Chief Clerk, B. & O. R. R., 4814 Monongahela Street, Pittsburgh, Pa. Recommended by J. A. Spielmann.

Rogers, F. D., District Manager, American Engineering Co., 419 Oliver Building, Pittsburgh, Pa. Recommended by A. Stucki.

Sheridan, P. J., Foreman, B. & O. R. R., 5411 Second Avenue, Glenwood, Pittsburgh, Pa. Recommended by J. S. Wampler.

Sladden, F. T., Assistant General Freeight Agent, P. & L. E. R. R., 220 P. & L. E. Station, Pittsburgh, Pa. Recommended by J. J. Monks.

Sponsler, W. L., Boiler Inspector, B. & O. R. R., 5210 Gertrude Street, Pittsburgh, Pa. Recommended by J. D. Conway.

Stofiel, Lawrence W., Salesman, Contractors Machinery & Supply Co., Wabash Building, Pittsburgh, Pa. Recommended by C. O. Dambach.

Stork, H. H., R. H. Foreman, B. & O. R. R., 5112 Blair Street, Pittsburgh, Pa. Recommended by J. S. Wampler.

Strub, H. G., Purchasing Department, Clark Car Company, 3258 Gaylord Avenue, Pittsburgh, Pa. Recommended by A. B. Severn.

Swift, W. G., Assistant to President, Clark Car Co., 2215 Shady Avenue, Pittsburgh, Pa. Recommended by A. B. Severn.

Taggart, Joseph P., Assistant General Passenger Agent, B. & O. R. R., 639 Union Arcade, Pittsburgh, Pa. Recommended by J. A. Spielmann.

Utley, E. H., General Manager, B. & L. E. R. R., Union Arcade, Pittsburgh, Pa. Recommended by C. O. Dambach.

Wetzel, G. H., Clerk, P. & L. E. R. R., 909 Fifth Street, McKees Rocks, Pa. Recommended by J. C. Gobrecht.

Weller, Lincoln, C. C. M. of W., Union R. R. Co., 1108 Trenton Avenue, Wilkinsburg, Pa. Recommended by R. S. Wilson.

Woozley, D. E., Engineer M. of W., Union R. R., Dravosburg, Pa. Recommended by R. S. Wilson.

Wilson, Edward E., Conductor, B. & O. R. R., 421 South Elizabeth Street, Hazelwood, Pittsburgh, Pa. Recommended by William C. Cox.

Young, DeWitt C., Conductor, B. & O. R. R., 114 Tecumseh Street, Pittsburgh, Pa. Recommended by W. H. Collins.

PRESIDENT: As soon as these applications have been approved by the Exxecutive Committee the gentlemen will become members without further action than the payment of one year's dues.

PRESIDENT: It is with deep sorrow that I announce the death of Mr. Walter V. Turner, Manager of Engineering of the Westinghouse Airbrake Co., who became a member of this club December 22, 1905, and died January 9, 1919. An appropriate memorial will appear in the next issue of the proceedings.

If there is no further business to come before the meeting, the next order will be the presentation of the paper of the evening. We are to have the pleasure of listening to Lieut. Commander D. C. Buell, of the United States Naval Reserve Force. It is very kind of him to come all the way here and bring the slides and films and it is only through his friendship for the Club and the persuasive powers of one of our members that brought him here. It is quite unnecessary to make any extended remarks in introducing the speaker of the evening, Lieutenant Commander D. C. Buell, who will now address you.

LIEUT. COMMANDER D. C. BUELL: Mr. President and fellow members of the Railway Club of Pittsburgh I do not know just how your honored President gets the idea that any one has to be coaxed to come and talk to you, for I feel that it is a distinction to be asked to talk to the Railway Club of Pittsburgh, and I wish to assure you that it did not require any coaxing at all as far as I was concerned.

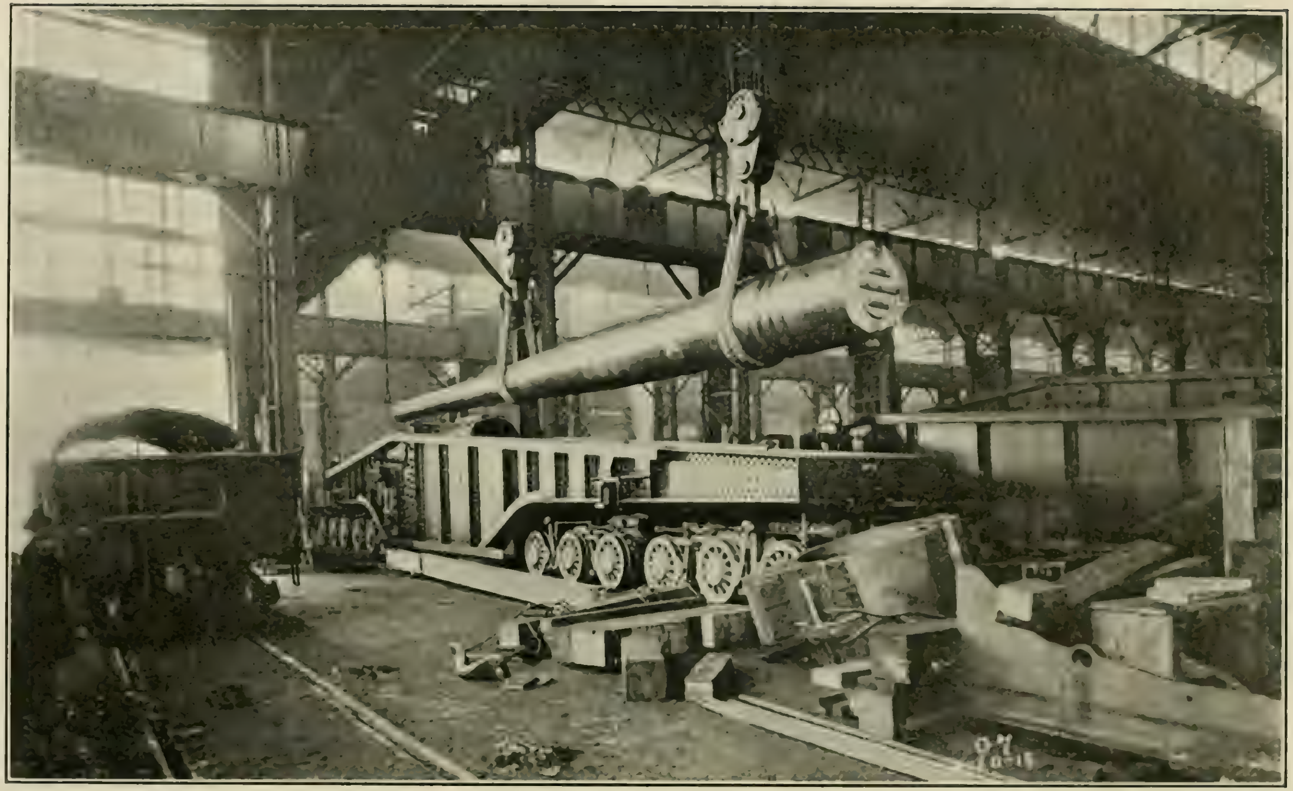
The subject of the evening is the U. S. Naval Railway Batteries in France.

A knowledge of the work done in getting these guns into action against the Germans should be of interest to every patriotic American, because they were the only American-made artillery that actually got into action against the Germans with the exception of a very limited number of small caliber field pieces. I make this specific statement for the reason that many of the things we have been led to believe were done in the war by the Americans, were largely matters of hope in the minds of those who expected to do them. The American people, of course, got into this war spirit so earnestly and were so enthusiastic about everything that was done, that in many cases our very enthusiasm led us to believe that we were doing more effective work in France than was really the case.

There is one great saving feature of the situation and that is the wonderful work our boys did over there. We did not have many areoplanes, we did not have any tanks, we did not have many guns or many shells; but we had the most wonderful soldiers of the entire war. Our boys, some of whom had not been in uniform over two or three months, when sent into battle, made good. They surprised themselves, their officers and the officers of all the foreign powers—they were wonderful. They saved America's name and reputation by making good so absolutely that many of the other matters, wherein we failed, were generously overlooked.

Railroading in France was very interesting work. It was carried on under extreme difficulties by the regiments of American railroad men. Their work is one of the accomplishments that will stand out brightly in the history of America's participation in the war.

While the personnel of the U. S. Naval Battery was made up entirely of naval officers and men, many of these men were attached to the battery because of their former railroad experience. While the battery was more or less an independent unit



14 Inch Gun Ready To Be Placed in Slide of Railway Mount.

during much of its stay in France, the very nature of the work brought those of us connected with the battery into close touch with the railroad men of the various Engineers Regiments, and gave us an opportunity to see a great deal of them and their work.

Before passing to the more formal account of our expedition, I want to pay a tribute to some of the members of this Club, who did such excellent work in France—General Atterbury, Colonel Maxfield, Lieutenant Colonel Barrett and numbers of others whom I might name, added to their previous accomplishments by their very effective work during their service in France. The Naval Battery was under obligation to these men many times, and it is a pleasure to again acknowledge their help and publicly thank them for the many courtesies extended to us.

The history of this Naval Battery forms a remarkable record of achievement, even in an organization as noted for great achievements as the American Navy.

Owing to a change in the characteristics of certain battle cruisers a number of 14-inch 50 caliber guns, originally built for these ships, became available during November, 1917, for other service. It was felt that if these guns could be placed upon railroad mountings that would make them readily mobile, they would prove a valuable adjunct to our artillery forces.

These 14-inch 50 caliber guns throw a 1400-pound projectile at a muzzle velocity of 2800 feet per second, giving, at high elevations, an effective range of nearly thirty miles. These guns throw a heavier projectile with greater accuracy and to a greater distance than any guns previously placed on mobile shore mounts.

But little preliminary discussion was necessary before the plan to use these guns in a Naval Railway Battery was approved, and on December 26th last the Naval Gun Factory Drawing Room at Washington began to prepare plans and specifications for the project. The final plans and specifications, not only for the mounts but for the locomotives, cars and other equipment necessary to form a complete land expedition, were completed in less than thirty days, being ready to submit for bids on the 25th of January.

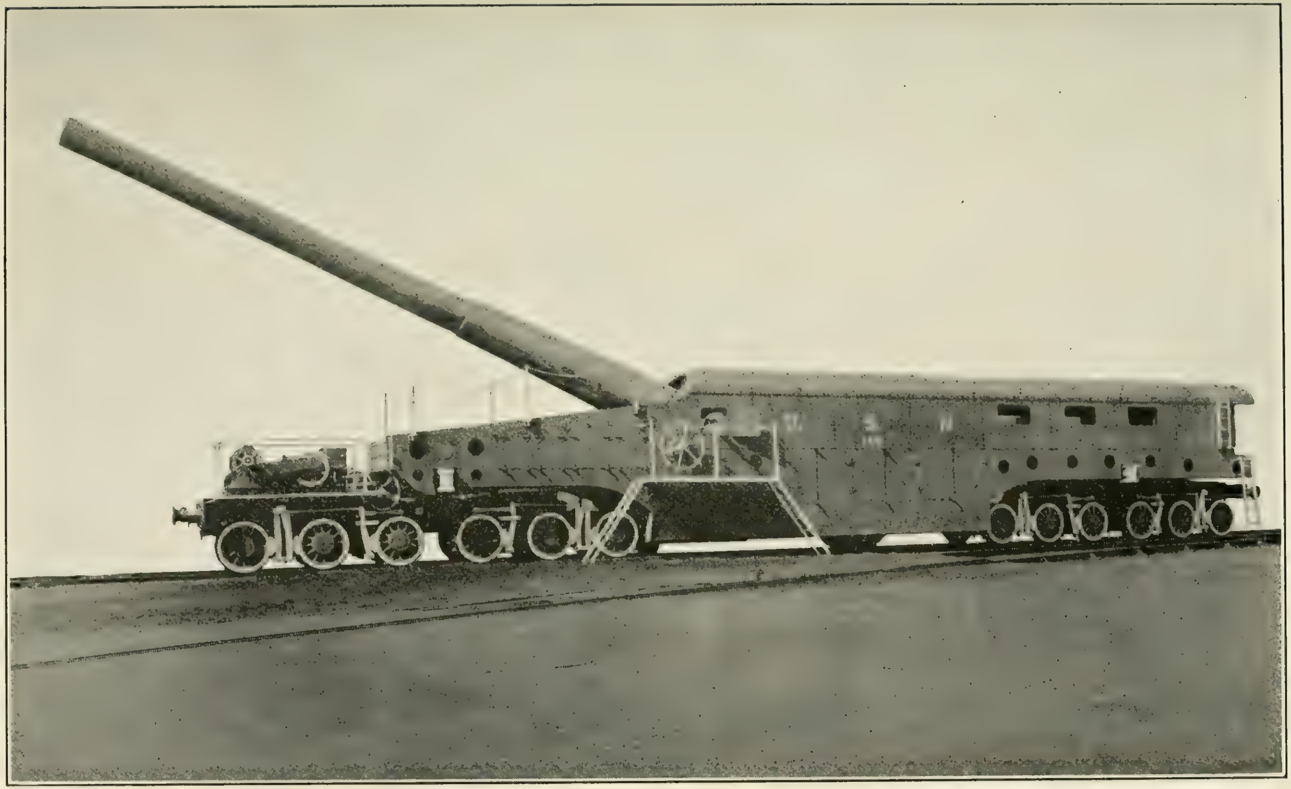
The plans and specifications called for five 14-inch Railway Gun Mounts, six locomotives and six complete trains of cars, 75 cars in all. On completion of the plans, proposals were immediately sent out by telegraph to the leading manufacturers of the country calling for an opening of bids on the morning of February 6. The first bids were rejected because time of delivery was not satisfactory—the Navy was not taking any chances on the war being over before they got into it—but as a number of manufacturing plants had representatives present when bids were opened a better understanding of the project was possible.

A second opening of bids was set for February 13th. The result of the second opening was very pleasing, and the contract was awarded on the afternoon of February 13th, and on the same evening the contractors began the work of gathering together the necessary material for the project. The date of delivery of gun cars and locomotives was set by the Baldwin Locomotive Works for June 15th, and the Standard Steel Car Company undertook to deliver the cars and special equipment by this same date.

In spite of the fact that the Baldwin Locomotive Works, noted for making perhaps the fastest manufacturing schedules in the country, had set June 16th as their earliest date, this project was speeded up so that the first mount was completed and moved from the Baldwin shops on the morning of April 25th, 72 days from the date bids were opened. This gun was taken to the Army Proving Ground at Sandy Hook for its firing test. The tests were entirely satisfactory.

The last of the guns was finished and delivered on May 25th, twenty days ahead of the Baldwin schedule. Practically all the cars and special equipment were delivered for shipment by June 1st, hardly one hundred days from the time bids were opened, and only 150 days from the time the project was first considered.

Entering the navy as I did from active business life, the thing that most impressed me, after this 100 days' of intensive work, was the fact that the Navy is just as fine a business organization as could be found anywhere in civil life. Admiral Earle and Captain Kearney, at the head of the Bureau of Ordnance, were true captains of industry. Delano, in charge of the design work, and Bye, to whom had been intrusted the general supervision of the work, were wonderfully efficient aids to their chief, and Chadwick, who handled the details of the design, was probably as capable a man in his line of work as any in the country. Tribute should also be paid to George T. Ladd, your fellow citizen, whose application for membership in this Club I



14 Inch Gun on Railway Mount.

noticed in the list read by the Secretary tonight, who left his business and came to Philadelphia to help out during the high pressure days before the completion of the mounts.

Another very impressive feature of the work was that there was practically no change in design necessary during construction. The original drawings were final drawings in almost every case.

Army officers who viewed the tests of the first gun were so impressed with its performance, and with the speed with which the project was being completed, that the Navy Bureau of Ordnance was requested to build for the Army three additional and identical mounts. Requisitions were prepared and material ordered for these three mounts May 18th. The first Army mount was finished complete and ready for shipment on July 17th. The second and third were completed for shipment July 25th.

When it was seen that the first three mounts built for the Army were nearing completion, the Navy Bureau of Ordnance was requested by the Ordnance Department of the Army, on July 18th, to build another lot of identical mounts. Work on these second three mounts was pushed, and the first of the last three was completed on September 16th, and the remaining two a few days later.

It is regrettable that these mounts built for the Army were not shipped to France in time to be erected and put into active service.

The original understanding was that the Naval Battery would operate with the British Army. By April 15th enormous quantities of material had arrived at the Philadelphia Navy Yard and shipment could have commenced at that time. On May 15th, with the completion of the entire project no more than two weeks distant, and no definite decision from the British as to the shipment of the guns, due to the fact that the German drive had threatened channel ports, the expedition was offered to General Pershing for use of the American Army. On May 23rd General Pershing cabled, requesting immediate shipment of the entire expedition to St. Nazaire, France.

The shipment of the equipment to France was delayed because of the fact that the German submarines which operated on this side of the Atlantic torpedoed the steamship Textile, inbout to take the guns and the girders to France, so that the first shipment was not made until June 20th. There are many who believe that these German submarines, as they sowed their first mines around the mouth of Delaware Bay, were sent over here for the purpose of preventing the shipment of these guns and their equipment to the other side.

The first shipment was followed by two other on July 4th. The final shipment of spare parts, extra guns, etc., was made on July 21st.

Anticipating the need of skilled men for erection work in France two hundred experienced railroad mechanics and operating men were selected from the forty thousand odd bluejackets at the Great Lakes Naval Training Station. This trained personnel was sent to France a little before the first ships of material sailed. The first shipment arrived at St. Nazaire on July 8th; the second and the third on July 21st.

The locomotive and car erection began July 20th.

The erection of the first gun was begun July 30th.

The first gun train was completed and ready to leave St. Nazaire on August 11th.

The first two gun trains left for the front on August 17th and August 18th, respectively.

The first gun mount was ready twelve days after the girder was unloaded from the ship.

The first two trains were ready 22 days after erection work started.

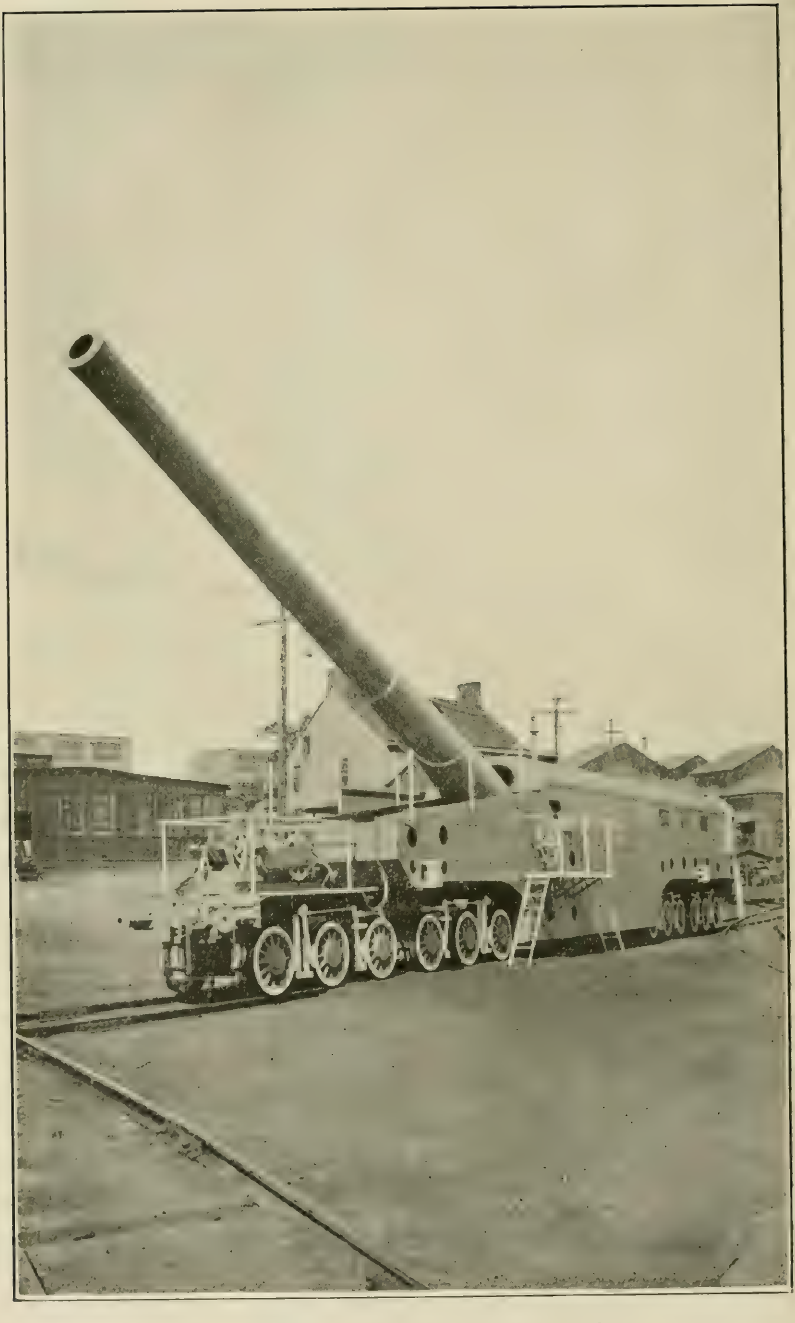
Trains 3 and 4 were completed, equipped and loaded September 12th; train No. 5 on September 13th; and train No. 6 on September 14th.

The last train left for the front on September 21st, and arrived at the base on September 22nd.

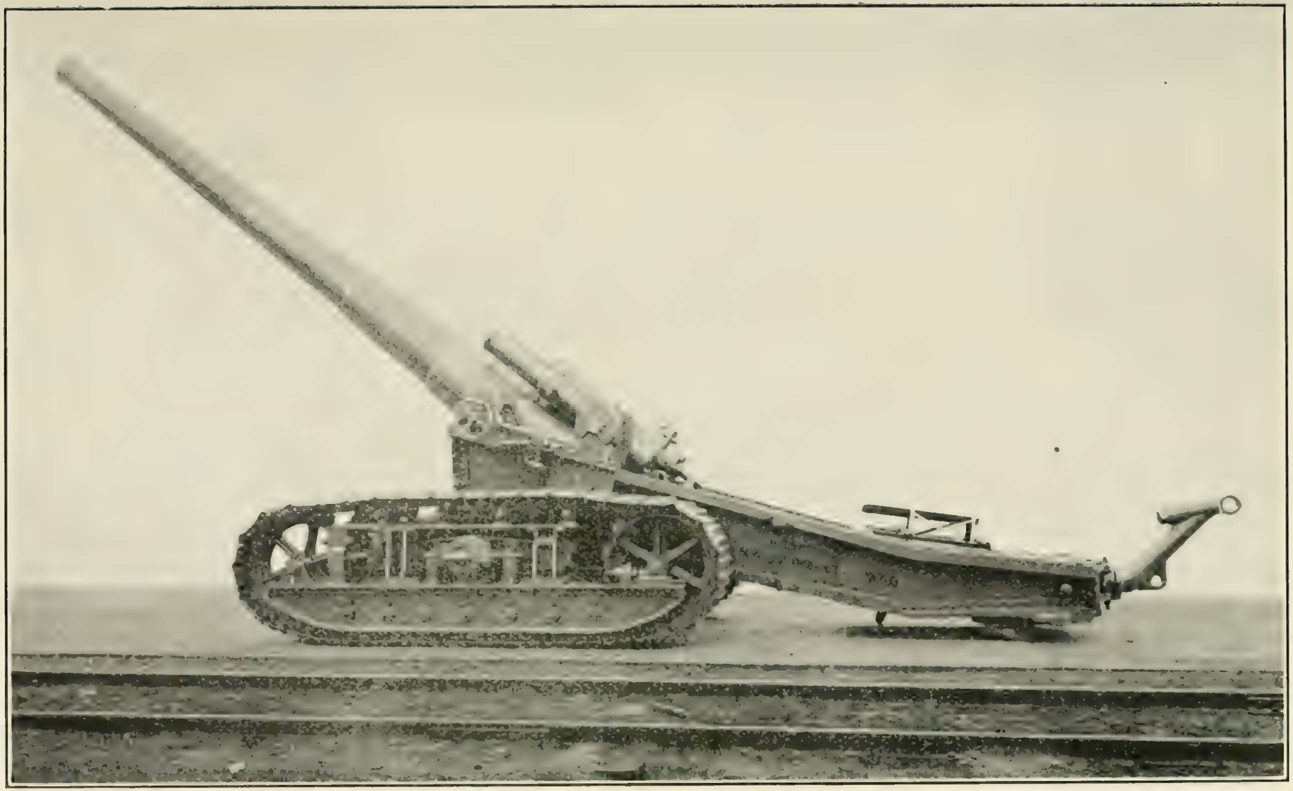
The first gun was fired against the Germans on September 5th, less than 250 days from the time the project was first thought of.

To give an idea of the execution of these guns I quote from a report of Admiral Plunkett:

"An examination of the various targets fired on by these 14-inch guns, after the Germans evacuated, has disclosed that the damage wrought by these weapons of destruction was terrible, and their accuracy marvelous. From an interrogation, also, of Russians and other prisoners recently released by Germany, after



14 Inch Railway Mount at Full Elevation.



7 Inch Caterpillar Tractor Mount at Full Elevation.

the cessation of hostilities, we are informed that the moral effect of these guns on the Germans was far greater than that which the 'Big Berthas' had on the French; and, furthermore, that the Germans were in great awe of and, in fact, regarded with fear and superstition 'shells the size of a box car, sounding like an express train coming through the air, which landed with fearful havoc so far behind their lines that it was inconceivable to them how a gun could be built that could hurl them such a distance.'

"Also from the mobility of the guns, they were led to believe that the Allies had hundred of these guns with which they were destroying their vital supply railroads and main lines of communication, simply demoralizing them; and this belief was further impressed upon them from the fact that each gun belched forth a ton of solid destruction every three minutes. Could you blame them?

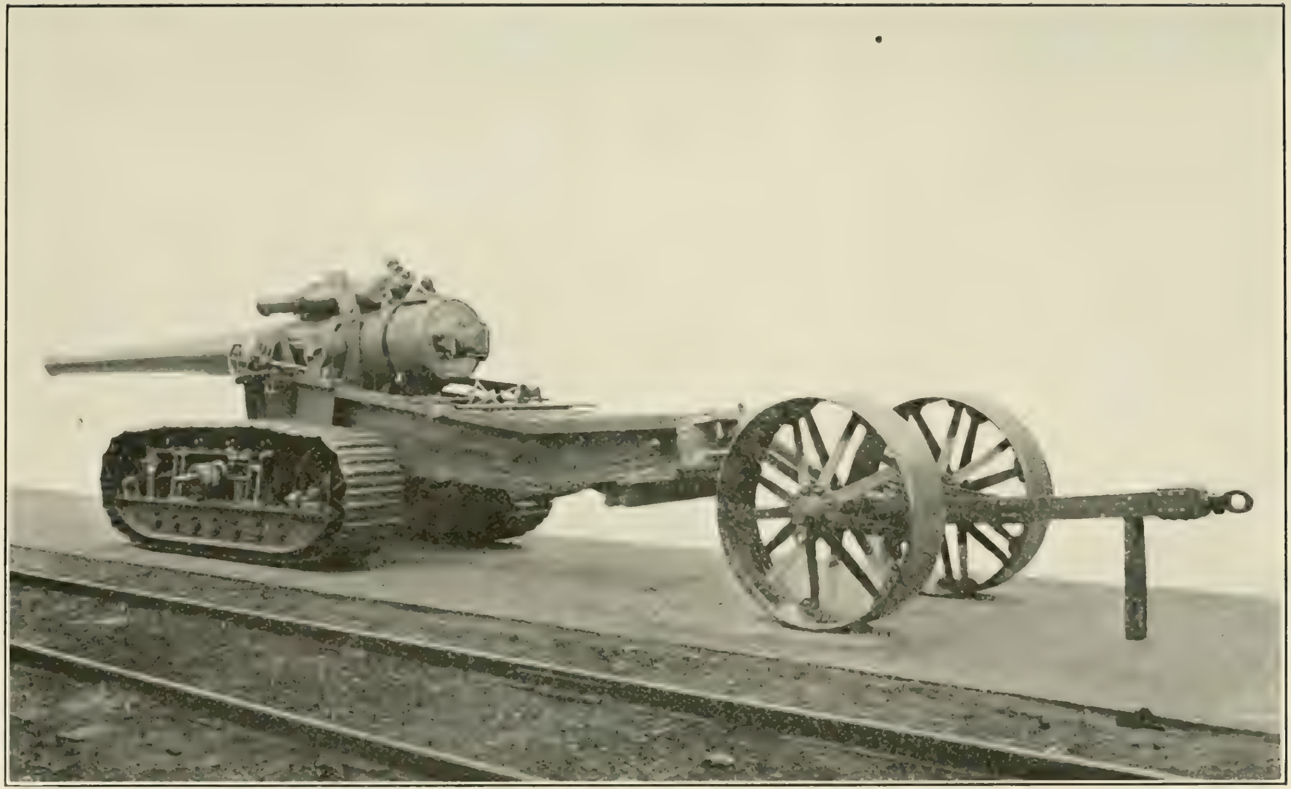
"At Laon, where Battery No. 1 fired many rounds, the French inhabitants who remained after the German evacuation stated that one shell landed in a German cinema while a moving picture was going on. All that could be found of forty of the Germans who were present was their identification tags; while the balance, sixty, were all terribly mangled. There was of course nothing left of the cinema.

"Also in the same town one projectile landed on a supply train in motion, derailing same and lifting a couple of box cars up bodily and depositing one of them on the storehouse platform nearby—of course smashing up both cars.

"Another shell landed in Montmedy right in General Gallowitz's headquarters, across from the staff headquarters of the German Crown Prince. Needless to say their quarters were immediately removed from that vicinity, and it is understood that about seventy Germans were killed or wounded by the explosion.

"It can readily be seen from the foregoing few instances of the wonderful things done by these 'Dutch Cleansers,' and also from the fact, which is now history, that these guns cut up the German main supply railroads and lines of communication, terribly congesting their traffic, that the morale effect of these guns on the Germans must have been by no means a small factor in the unaccountably rapid collapse of the German organization.

"In addition to the moral effect these guns had on the Germans, any one who ever saw the monstrous trucks necessary to



7 Inch Caterpillar Tractor Mount With Limber Ready for Holt Tractor.

carry these giant guns on wheels, can fully appreciate the effect that the sight of these guns traveling up to the front must have had on those French people who were so fortunate as to have seen them. The inhabitants of all the towns through which the guns passed greeted us with flowers, shouting 'finis la guerre,' and giving every other indication which they were capable of making that they fully believed it to be the beginning of the end. Even they thought, due again to the mobility of the guns, that there were many more of them in France than really was the case, as in traveling from front to front they, of necessity, saw the same guns a couple of times."

At this point of Mr. Buell's talk the lights were turned out and a number of lantern slides and a reel of motion picture film were shown, illustrating the work of constructing these mounts in America, and the further work of erecting guns, locomotives and cars in France.

In describing the pictures shown, Mr. Buell told of many interesting incidents which took place during the work, beside describing the facilities available for doing this erection work in France; and the method followed in accomplishing the erection of this entire expedition in less than eight weeks.

After showing the slides and motion pictures, Mr. Buell closed his lecture as follows:

"Too high commendation cannot be given those who conceived this project. The entire equipment operated in a highly satisfactory manner, and practically without change from the original design. The question as to the guns being too heavy to transport over French railroads proved groundless. The pit, which the French at first criticized, proved a very valuable feature when the guns were fired at a fixed target for any length of time.

"It was suggested by the French that if a similar type of mount could be devised for use where it was desired to bring the gun into action quickly, it would obviate the only possible objectionable feature of the first mount. It is interesting to note that the Navy Bureau of Ordnance, anticipating this requirement, had already designed and was building another battery of 14-inch mounts before the armistice was signed. These new mounts were designed to be fired direct from the track, at all elevations, without any preliminary preparation whatsoever. These new guns, had they been required, would have been ready to ship to France by February, 1919.

As far as can be ascertained, there were no finer or more accurate shooting guns in the war than these first 14-inch mounts. Had the new mounts been added to and consolidated with the first expedition it would have been difficult for any nation to conceive and execute a finer battery of guns than the United States Naval Batteries.

PRESIDENT: This has been a wonderfully interesting presentation. Is there any discussion or has any one any question to ask?

MR. J. G. CODE: I think there is no doubt that the Club very highly appreciates this magnificent report given by Lieutenant Commander Buell. Ever since our celebrated sailors began to return from France and the restrictions of the censorship were modified, I have been very frequently reminded of some advice I got a good while ago to the effect that you can't believe everything you hear and not more than about half of what you see. And for fear some of the other men here have had the same advice, I think it might be well to have Lieutenant Commander Buell's statements, except insofar as they relate to his associate, corroborated by Lieutenant Commander Ladd, who is present.

PRESIDENT: Will the Lieutenant Commander kindly come forward?

LIEUT. COMMANDER GEORGE T. LADD: I can not add anything to the lecture that has already been given.

LIEUT. COMMANDER BUELL: The pictures I have of the 7-inch caterpillar mounts as built for the marines are Mr. Ladd's property. He built the guns, and I hope to be able to prevail upon him to show them to you here tonight. I do not know why he is so bashful. I believe you ought to see them and I believe he is entitled to the credit of the membership knowing of the work that he has done.

Lieut. Commander George T. Ladd presented moving pictures illustrating the history and description of 7-inch Caterpillar Tractor Mounts as follows:

"An entirely new design of field artillery mounted upon caterpillars has been perfected by the navy, and immediately put into production without the building of an experimental mount or the conducting of exhaustive tests.

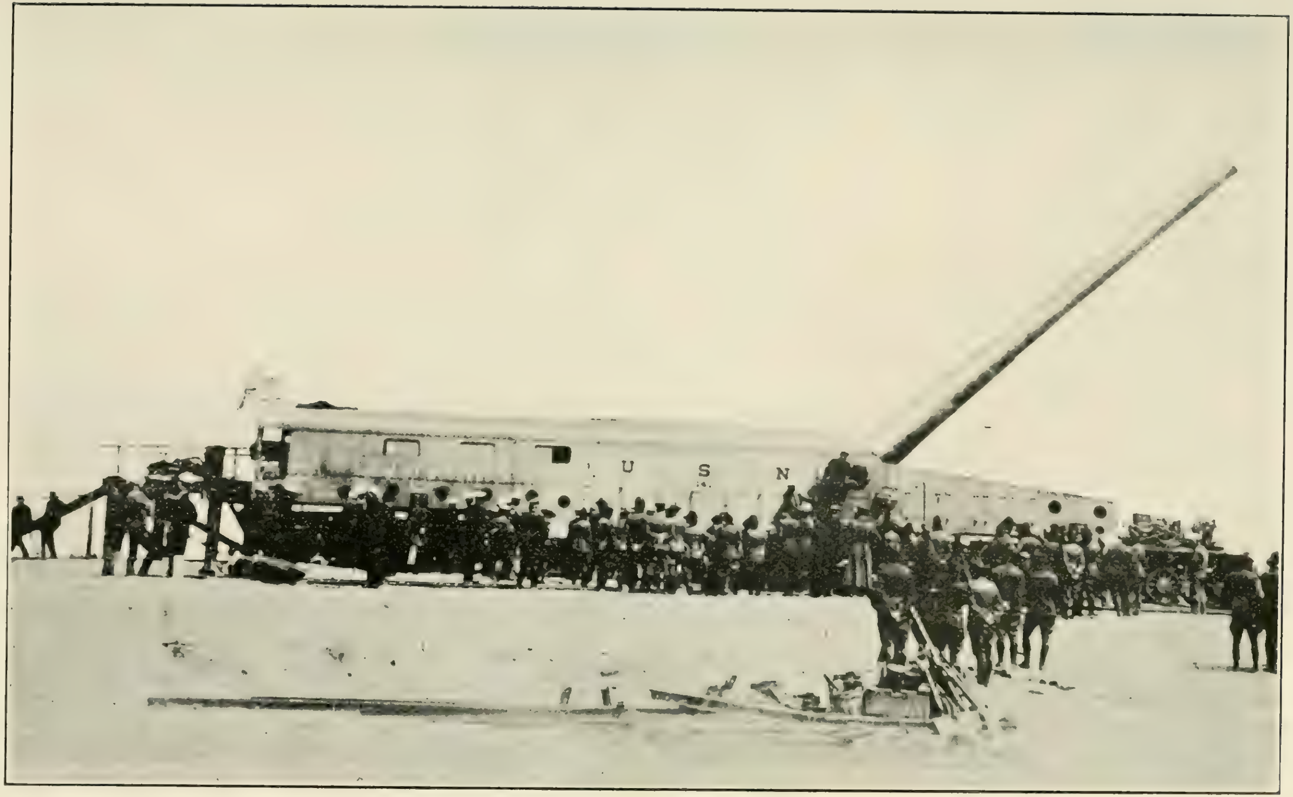
"The object of the caterpillar was to effect a construction that would reduce the ground impact per square inch, obviating resetting of the mount after the firing of a shot. This construction also provides a more stable and easily handled piece of field artillery when hauled over the uneven ground surfaces behind advancing troops.

"For some time the navy had been aware of the fact that the 7-inch rifles upon battleships had not been satisfactory as a broadside mount; a 7-inch rifle was too small for turret mounts and too large for broadside mounts. As a result of removal of these guns from battleships, a number of these 7-inch rifles were available. The desirability of putting these guns into quick service was apparent due to the fact that the army of this country had absolutely no rifles for long range work. To start with, an order for twenty of these mounts was placed with the Baldwin Locomotive Works; these mounts to be used by the Tenth Regiment of the United States Marine Corps in France.

"Practically all materials of construction were on special specification, the loads being extremely severe. The most careful inspection of both material and workmanship was required. Patterns, jigs, gauges, templates, etc., all had to be constructed and the work was pushed continuously night and day, Sundays and holidays. Approximately thirty sub-contractors were engaged upon various portions of the work, all assembly taking place at the Eddystone plant of the Baldwin Locomotive Works. Detailed parts of the mounts were absolutely interchangeable so that repair or spare parts could instantly be applied when necessary.

"Ninety-three days after the contract was placed the first two of these mounts were loaded on cars, and shipped to the Indian Head Proving Ground for test. In every way they were 100 per cent, both as to handling and action under fire.

"The rifles are 7-inch, 45 caliber, throw a projectile weighing approximately 153 pounds, and carry a high explosive charge of 27 to 30 pounds of T. N. T., and a 58-pound smokeless powder propelling charge. These guns have a range of approximately 32,000 yards, or 16 to 17 miles, at full elevation of 40 degrees. The total weight of each of these mounts, complete



14 Inch Railway Mount, at Full Elevation. Firing Test at Sandy Hook, April 27, 1918.

with limber, is 83,000 pounds; and they were arranged to be hauled into position in the field by means of two 120 H. P. "Holt" Caterpillar Tractors.

"The war being completed before the Tenth Regiment of the Marine Corps received instructions to go abroad, the delay in their receiving such instructions having been due to army interference and jealousy, none of these mounts were put into actual service, but are being stored for use by the Marine Corps at points where their services may be required.

"After the efficacy of these mounts had been demonstrated, a contract for 36 additional mounts was placed with the Baldwin Locomotive Works; the Navy building these mounts for the Army. With the closing of the war, one-half of this number has been cancelled and 18 only are being completed."

PRESIDENT: I do not know how we can adequately thank Lieut. Commander Buell for his kindness and his very interesting and instructive lecture, and also Lieut. Commander Ladd for his illustrations and talk on the caterpillars. I think the least we can do is to offer a rising vote of thanks.

MR. D. J. BEDDING: I wish to make such a motion. I feel that we are very greatly indebted to both these gentlemen, both for their talk and for the opportunity to see what was done in a hurry toward helping to win the war particularly the part this district took in the game. I would really like, though, to have a few moments private conversation with Commander Buell, to know where we can hire some of those fellows such as he showed hustling around in the machine shop.

I feel that we should offer a rising vote of thanks to these gentlemen, and I so move.

The motion was duly seconded and prevailed by unanimous vote.

There being no further business the meeting adjourned at 10:57 o'clock p. m., to luncheon.

J. D. CONWAY, *Secretary.*

In Memoriam

WALTER V. TURNER

Died, January 9, 1919

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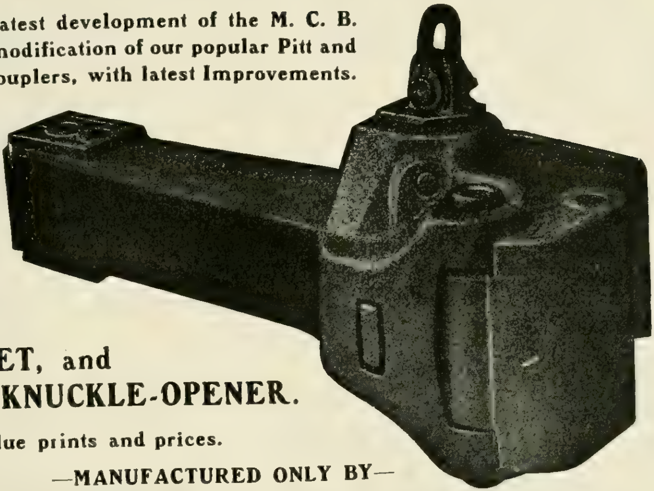

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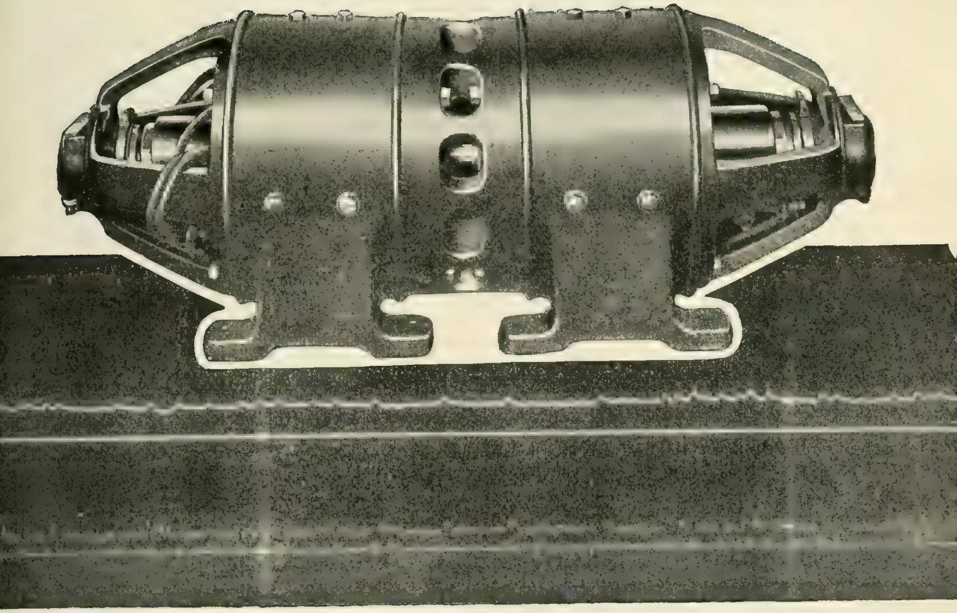

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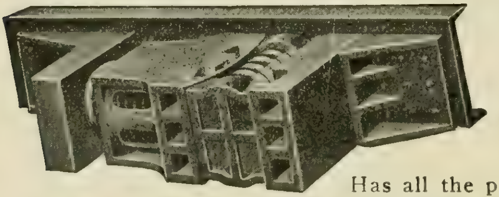

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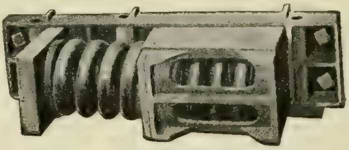

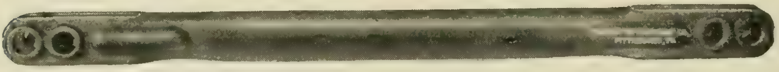

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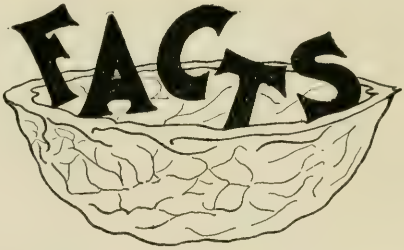

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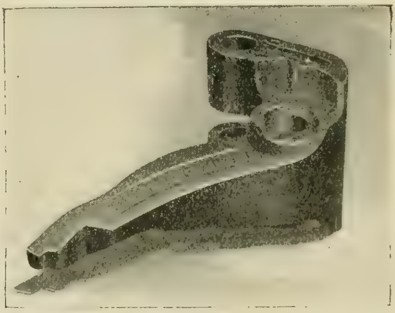

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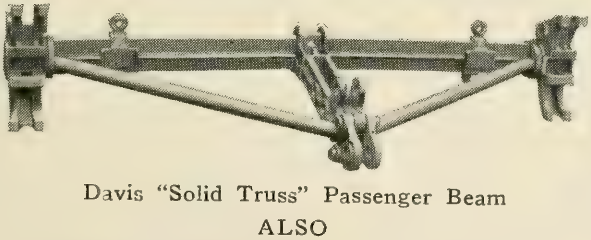

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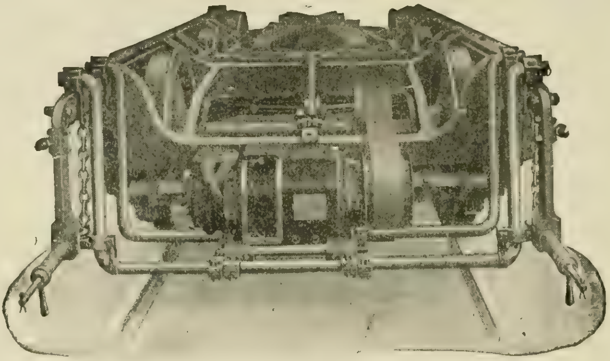

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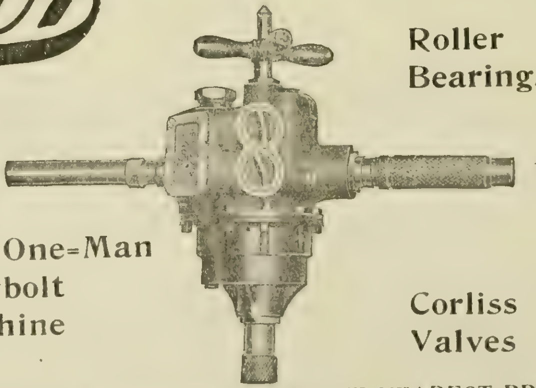

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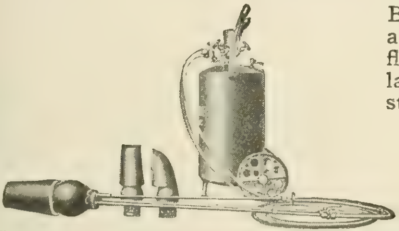

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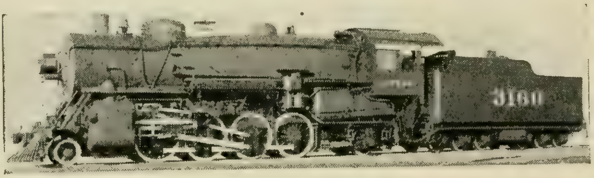

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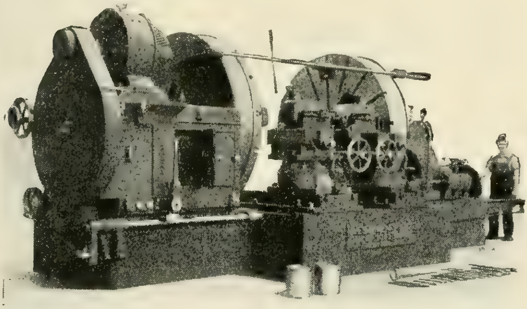

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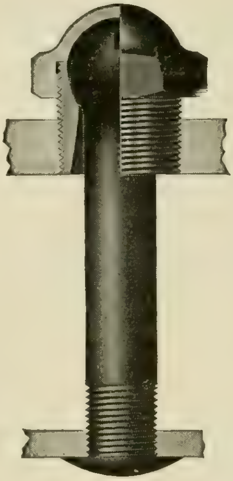

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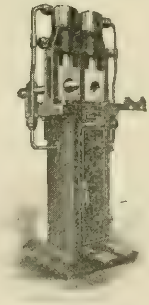

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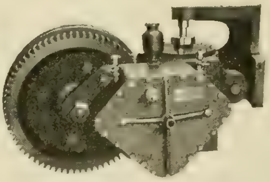

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RAILWAY CLUB NOTES.

The following subjects were presented and discussed by the several Railway Clubs during the month of February, 1919, as noted below:

New York Railroad Club, Harry D. Vought, Secretary,
95 Liberty Street, New York, N. Y.

SUBJECT—"The Arithmatic of Railroading," Prof. W. J. Cunningham.

New England Railroad Club, Wm. E. Cade, Jr., Secretary,
683 Atlantic Avenue, Boston, Mass.

SUBJECT—"The United States Naval Railway Batteries in France" by Lieut. Commander D. C. Buell of The U. S. N. R. F.

Richmond Railway Club, F. O Robinson, Secretary,
Richmond, Va.

SUBJECT—Not received.

St. Louis Railway Club, B. W. Frauenthal, Secretary,
Union Station, St. Louis, Mo.

SUBJECT—"The League of Nations" by Hon. Chas. M. Hay.

Southern & South Western Railway Club, A. J. Merrill, Secretary,
Box 1205, Atlanta, Ga.

SUBJECT—Not received.

Central Railway Club, Buffalo, N. Y., Harry D. Vought, Secretary,
95 Liberty Street, New York, N. Y.

SUBJECT—Not received.

Pacific Railway Club, William S. Wollner, Secretary,
64 Pine Street, San Francisco, Cal.

SUBJECT—"Train and Engine Loading" by T. H. Williams, Assistant General Manager, Southern Pacific Railroad and A. H. Babcock, Consulting Electrical Engineer, Southern Pacific Railroad.

The Railway Club of Pittsburgh, J. D. Conway, Secretary,
515 Grandview Avenue, Pittsburgh, Pa.

SUBJECT—"Safety From the Standpoint of Industrial Efficiency" by C. W. Price, General Manager, National Safety Council.

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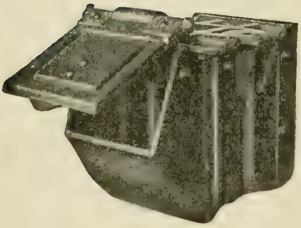

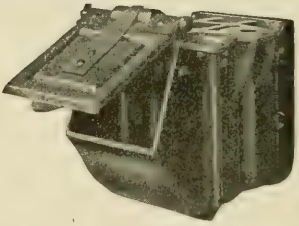

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OF

The Railway Club of Pittsburgh

Organized October 18, 1901.

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Vol. XVIII. No. 3. **Pittsburgh, Pa., Feb. 27, 1919** $1.00 Per Year 25c Per Copy

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Past Presidents

J. H. McCONNELL	October, 1901, to October, 1903.
L. H. TURNER	November, 1903, to October, 1905.
F. H. STARK	November, 1905, to October, 1907.
* H. W. WATTS	November, 1907, to April, 1908.
D. J. REDDING	November, 1908, to October.1910.
F. R .McFEATTERS	November, 1910, to October, 1912.
A. G. MITCHELL	November, 1912, to October, 1914.
F. M. McNULTY	November, 1914, to October, 1916.
J. G. CODE	November, 1916, to October, 1917
D. M. HOWE	November, 1917, to November, 1918.

* Deceased.

Meetings held fourth Thursday of each month, except June, July and August.

"RESOLVED, by The Railway Club of Pittsburgh, that any of its members who have now, or who may, during the present World's War, become one of our Country's defenders by joining the Military or Naval Forces of the United States, or who by reason of membership in the American Red Cross, or other Associations in connection with War Activities, are called away from home, shall be exempt from dues and continued as members in good standing until their return home from the War, and that the Secretary shall prepare a Roll of Honor showing such members for the records of the Club."

—ROLL OF HONOR—

ATTERBURY, W. W., Vice-President, Penna. R. R., Broad Street Station, Philadelphia, Pa. (Brigadier-General, Director General of Transportation, American Expeditionary Forces.)

BAKEWELL, DONALD C., Asst. Treas., Duquesne Steel Foundry Co., Pittsburgh, Pa. (Captain, Ordnance Dept., Chicago, Ill.)

BRASHEAR, DR. JOHN A., 1954 Perrysville Avenue, N. S., Pittsburgh, Pa. (National Research Council, U. S. A.)

BROWNSCOMB, G. J., Clerk, Union R. R. Co., East Pittsburgh, Pa. (Canadian Regiment, overseas.)

BUELL, D. C., Director, The Railway Educational Bureau, Omaha, Neb. (Lieutenant Commander, U. S. Navy, Ordnance Department.)

CHRYSTAL, W. A., Bookkeeper, Montour R. R., Pittsburgh, Pa. (Headquarters Company, 319th Infantry, Camp Lee, Petersburg, Va.)

CONNER, WILLIAM P., Efficiency Inspector, P. R. R., Monongahela City, Pa. (Lieutenant, Co. A, 54th Engineers, American Expeditionary Forces, London, England.)

CUNNINGHAM, R. I., Mechanical Expert, W. A. B. Co., Wilkinsburg, Pa. (First Lieutenant, 31st Engineers Reserve Corps, American Expeditionary Forces.)

DEAN, RANDOLPH F., Signal Repairman, P. C. C. & St. Louis Railway, 729 Washington Avenue, Carnegie, Pa. (Battery 4, R. O. T. C., Military Branch, Chattanooga, Tennessee.)

ELLIOT, A. H., Representative, American Brake Shoe & Foundry Co., Philadelphia Pa. (Captain, Engineers Reserve Corps, American Expeditionary Forces.)

FARQUHAR, L. C., Allegheny Steel Co., Pittsburgh, Pa. (First Lieutenant, Ordnance R. C.)

GYLLENFLYCHT, T. E., Draftsman, Pressed Steel Car Co., 1012 Criss Street, Sheridan, Pa. (Captain, 53d Regiment, U. S. Infantry, Chattanooga, Tennessee.)

HEWITT, ELLIS E., Draftsman, W. A. B. Co., Wilmerding, Pa. (Cadet, Air Service, Fort Monroe, Va.)

HOOVER, F. M., President, Hoover & Diggs Co., Pittsburgh, Pa. (Overseas Duty, Y. M. C. A.)

HOTT, G. H., Assistant Yard Master, Monongahela R. R. Co., Brownsville, Pa. (Corporal, Supply Company, 330th Infantry, Camp Sherman, Ohio.)

HOWE, HARRY, Inspector of Castings, Pressed Steel Car Co., McKees Rocks, Pa. (Captain, 107th Field Artillery Supply Company, Camp Hancock, Georgia.)

HUFF, GEORGE F., JR., Assistant Road Foreman Engines, Pennsylvania R. R., Harrisburg, Pa. (Captain, 19th U. S. Engineers (Railway) American Expeditionary Forces.)

KATZIN, WILLIAM, Draftsman, Pressed Steel Car Company, 701 Broadway, McKees Rocks, Pa. (Private, Company E., 319th Infantry, Camp Lee, Va.)

LINDNER, W. C., Foreman Car Repairs, Penna. R. R., 2125 Union Avenue, Altoona, Pa. (Captain, E. O. R. C. 35th Engineers (Railway) Camp Grant, Ill.)

LOCKWOOD, CHAS. H., Draftsman, Pressed Steel Car Co., 366 Lincoln Avenue, Bellevue, Pa. (Second Lieutenant, 7th Battalion, Infantry Replacement Camp, Camp Lee, Va.)

MASON, R. L., Railway Material, Pittsburgh, Pa. (Y. M. C. A. work in France.)

MAXFIELD, H. H., Supt. Motive Power, Penna. R. R., Pennsylvania Station, New York, N. Y (Colonel, 19th U. S. Engineers (Railway) American Expeditionary Forces.)

MORRIS, H. W., Purchasing Agent, Pittsburgh & West Virginia Railway, 115 Belmont Avenue, Crafton, Pa. (First Lieutenant, Ordnance Department, Production Section, Carriage Division.)

MORRIS, J. M., Assistant Master Mechanic, Penna. R. R., Verona, Pa. (First Lieutenant, E. O. R. C., 35th Engineers (Railway) Camp Grant, Ill.)

MURPHY, PAUL F., Civil Engineer, Penna. R. R., Aspinwall, Pa. (First Class Machinist Mate, Naval Reserves, 2nd Naval District, Newport, R. I.)

RAMBO, R. E., Civil Engineer, P. R. R., Pittsburgh, Pa. (223d Squadron, Aviation Camp, Waco, Texas.)

RICHERS, G. J., Assistant Master Mechanic, Penna. R. R., Verona, Pa. (First Lieutenant, Headquarters Detachment, 15th U. S. Engineers, American Expeditionary Forces.)

ROBBINS, F. S., Assistant Master Mechanic, Penna. R. R., 28th Street, Pittsburgh, Pa. (Captain, 19th U. S. Engineers (Railway) American Expeditionary Forces.)

SMITH, CHANDLER P., General Manager, P. L. & W. R. R., Lisbon, Ohio. (First Lieutenant, Company 3, E. O. R. T. C. Engineers.)

STORRS, CHARLES P., Manager, R. R. Dept., Storrs Mica Co., Owego, N. Y. (Lieutenant, U. S. Navy.)

STRAUB, V. V., Salesman, Star Brass Manufacturing Co., 104 E. Dedham Street, Boston, Mass. (Private, Signal Corps, School for Officers, Camp Kelly, Texas.)

WHITMAN, E. B., Assistant Road Foreman of Engines, Penna. R. R., Pittsburgh, Pa. (Captain, 19th U. S. Engineers (Railway) American Expeditionary Forces.)

WILLIAMS, HAROLD S., Stenographer, Pressed Steel Car Co., 99 South Grant Street, Bellevue, Pa. (Private, 35th Engineers (Railway) Camp Grant, Ill.)

WIPPERMAN, F. B., Traveling Engineer, Ohio Injector Co., 1437 Monadnock Block, Chicago, Ill. (First Lieutenant, E. O. R. C., Company B, 311th Engineers, Camp Grant, Ill.)

NOTE—In order to keep the above Roll of Honor correct to date the Secretary will be glad to be advised of any additions or corrections thereto.

PROCEEDINGS OF MEETING

FEBRUARY 27, 1919.

The meeting was called to order at the Americus Club House, Pittsburgh, Pa., at 8 o'clock P. M., President Spielmann in the chair.

The following gentlemen registered:

MEMBERS

Adams, L.
Anderson, A. E.
Arnod, J. G.
Babcock, F. H.
Batty, John
Beattie, J. A.
Beegle, R. B.
Bennett, R. G.
Berg, K.
Bowden, T. C.
Bradley, W. C.
Branson, C. R.
Brant, W. J.
Buffington, W. P.
Carroll, Frank E.
Cartwright, Wm. E.
Christy, F. X.
Clark, C. C.
Clark, Harvey
Cline, W. A.
Code, J. G.
Conway, J. D.
Courtney, D. C.
Crenner, J. A.
Daly, P. J.
DeCoudres, R. B.
Drayer, U. S.
Durant, Charles H.
Durkin, Jas. E.
Ellis, C. B.
Emery, E.
Ferren, Robert O.
Forrest, C. H.
Frazier, L. E.
Freshwater, F. H.
Frey, A. P.
Gearhart, J. A.
Geisler, Jos. J.
Gellinger, C. W.
George, M. E.
Glaseman, W. J.
Gleason, D. T.
Gobrecht, J. C.
Grewe, H. F.
Groomes, B. B.
Gross, C. H.
Harrigan, P. J.
Harris, J. P.
Haskin, H. L.
Haynes, J. E.
Hoffman, C. T.
Howe, D. M.
Huber, H. G.
Huchel, H. G.
Huchel, Wm. J.
Innes, H. W.
Johnson, E. A.
Johnson, John F.
Jones, P. A.
Keptner, J. B.
Kerby, F.
Kinch, L. E.
Kindle, W. F.
Kinter, D. H.
Koch, H. J.
Krepps, T. S.
Lanahan, J. S.
Lawson, A. F.
Lobez, P. L.
Long, R. M.
Lowe, W. D.
Lynn, Jr., Wm.
Mackenzie, R. H.
MacKinney, Morgan

Matchett, H. K.
Marshall, W. T.
Millar, C. W.
Milroy, Wm.
Miyasaki, Y.
Moyer, Oscar G. A.
McConn, G. E.
McConnell, P. L.
McDowell, D. W.
McFeatters, F. R.
McMullen, Clark E.
McNulty, F. M.
Neff, John P.
Painter, Joseph
Patterson, J. E.
Perhson, Alf. K.
Pfeil, John
Proven, John
Redding, D. J.
Reed, E. V.
Richardson, C. A.
Riddile, F. C.
Robeck, George B.
Schaich, Wm. L.
Seiss, Wm. C.
Sewell, H. B.
Shirk, A. R.
Smith, F. C.
Smith, J. B.
Smith, John L.
Stark, F. H.
Stauffer, A. H.
Stucki, A.
Suckling, R. C.
Turner, L. H.
Vowinkel, F. F.
Weller, Lincoln
Williamson, J. A.
Wilson, D. L.
Wilson, W. J.
Wolf, H. M.

VISITORS

Baily, J. H.
Brend, H. B.
Burst, F. E
Carter, Arnold F.
Charlton, W.
Church, C. C.
Courtney, H.
Crawford, C. H.
Crookston, W. G.
Cunningham, H. R.
Cunningham, Howard L.
Darrah, C. B.
Donahoe, F. F.
Forney, H. L.
Garratt, L. W.
Gilson, George I.
Gorman, J. C.
Hanna, R. B.
Harsh, H. H.
Hitchcock, F. A.
Huff, A. B.
Hunter, W. B.
Jamieson, R.
Jones, David J.
Jones, V. J.
King, J. W., Jr.
Kipp, R. H.
Krepps, Frank S.
Kurtz, Benj. F.
Miller, Gordon
Milligan, J. K.
Moss, R. N.
Myers, Chas. H.
Myers, W. H.
McGrann, E. Roy
McGregor, D. C.
McGregor, S. S.
McMillan, C. M.
Nelson, W. O.
Nicholas, A. D.
Price, C. W.
Price, W. F.
Rasmussen, W. R.
Redding, R. D.
Robinson, J. J.
Seubert, Harry J.
Sponsler, W. L.
Stofiel, L. W.
Stom, Dr. P. R.
Swift, T. O.

Syster, H. M.
Teal, J. E.
Thompson, J. R.
West, John W.
Wilson, H.

The reading of minutes of previous meeting was dispensed with.

The Secretary read the following list of applications for membership:

Amman, W. F., Assistant Purchasing Agent, The Monongahela Conn. Railroad Co., 209 Moye Street, Mt. Oliver, Pa. Recommended by F. M. McNulty.

Appelbe, John M., General Foreman, B. & O. R. R., 1136 Berkshire Avenue, Pittsburgh, Pa. Recommended by W. H. Collins.

Ashworth, Wm., Sales Manager, Johnston, Morehouse & Dickey Co., 106 Market Street, Pittsburgh, Pa. Recommended by J. A. Spielmann.

Aston, A. Rowland, Assistant to Chief Engineer, Monongahela Conn. R. R., Fourth and Kennedy Avenues, Duquesne, Pa. Recommended by K. W. Runser.

Bailey, J. A., Clerk, B. & L. E. R. R., 2021 Delaware Avenue, Swissvale, Pa. Recommended by R. S. Wilson.

Brown, Guy B., Agent, B. & L. E. R. R., Universal, Pa. Recommended by R. S. Wilson.

Coumis, Gust, Draftsman, Standard Steel Car Co., Butler, Pa. Recommended by Harry T. Anderson.

Cromlish, Wm. L., Coal Freight Agent, B. & O. R. R., 915 Oliver Bldg., Pittsburgh, Pa. Recommended by J. A. Spielmann.

Crookston, W. G., Power Director, P. R. R., 907 N. Braddock Avenue, Homewood, Pa. Recommended by P. L. McConnell.

Cunningham, F. F., Engineer, B. & O. R. R., 5234 Gertrude Street, Pittsburgh, Pa. Recommended by William C. Cox.

Cunningham, H. R., Clerk, Pressed Steel Car Co., 441 Jefferson Avenue, Bellevue, Pa. Recommended by Lewis Adams.

Dosinger, F. A., Draftsman, Standard Steel Car Co., Engineering Department, Butler, Pa. Recommended by Harry T. Anderson.

Dunn, James, Storekeeper, Standard Steel Car Co., 106 Wood Street, Butler, Pa. Recommended by Harry T. Anderson.

Exline, N. E., Clerk, B. & L. E. R. R., Port Perry, Pa. Recommended by R. S. Wilson.

Evans, C. D., Assistant to Paymaster, Monongahela Conn. R. R. Co., 802 Jones & Laughlin Bldg., Pittsburgh, Pa. Recommended by F. M. McNulty.

Fisher, Edward C., Manager, American Locomotive Co., N. S., Pittsburgh, Pa. Recommended by F. M. McNulty.

Gardner, K. C., Manager of Sales, Pressed Steel Car Co., Farmers Bank Bldg., Pittsburgh, Pa. Recommended by Henry P. Hoffstot.

Garratt, Louis W., Representative, Hausman & Wimmer Co., 1050 Hiland Avenue, Coraopolis, Pa. Recommended by G. E. McConn.

Glosser, Wallace W., General Sales Agent, The Madden Co., Railway Exchange, Chicago, Ill. Recommended by C. O. Dambach.

Gorman, J. C., Superintendent, McK. C. R. R., 3608 Woodland Avenue, McKeesport, Pa. Recommended by J. A. Beattie.

Graham, J. H., C. C. G. F. A., B. & O. R. R., 922 Oliver Bldg., Pittsburgh, Pa. Recommended by J. A. Spielmann.

Greenough, L. C. D., Estimator, Standard Steel Car Co., 224 E. Fulton Street, Butler, Pa. Recommended by Harry T. Anderson.

Haines, W. L. R., Assistant Engineer, P. R. R. Western Lines, 1123 Penna. Station, Pittsburgh, Pa. Recommended by D. M. Howe.

Harter, Arnold, Assistant Foreman, W. A. B. Co., Tonnelueka Club, Wilmerding, Pa. Recommended by F. E. Carroll.

Hatt, Harry, Inspector, W. A. B. Co., 658 A. Middle Avenue, Wilmerding, Pa. Recommended by F. E. Carroll.

Hill, C. Phillis, President, Doubleday-Hill Electric Co., 719 Liberty Avenue, Pittsburgh, Pa. Recommended by D. H. Amsbary.

Jacobs, M. H., Division Freight Agent, B. & O. R. R., 705 Fayette Title & Trust Bldg., Uniontown, Pa. Recommended by J. A. Spielmann.

Johnston, J. C., Yard Master, Union Railroad, North Bessemer, Pa. Recommended by R. S. Wilson.

Jones, David J., M. M., McK. C. R. R., 1010 Patterson Ave., McKeesport, Pa. Recommended by J. A. Beattie.

Jones, L. E., Valuation Engineer, Terminal Railroads, Carnegie Steel Co., Room 1012 Carnegie Bldg., Pittsburgh, Pa. Recommended by W. C. Bradley.

Jones, V. J., Salesman, Ind. Pneumatic Tool Co., 1208 Farmers Bank, Pittsburgh, Pa. Recommended by C. W. Gellinger.

Kmentt, W. D., Draftsman, Standard Steel Car Co., Butler, Pa. Recommended by Harry T. Anderson.

Kusha, J., Clerk, B. & L. E. R. R., Universal, Pa. Recommended by R. S. Wilson.

Lindsay, G. W., Req. Dept., Standard Steel Car Co., Butler, Pa. Recommended by Harry T. Anderson.

Lutz, Lester C., Clerk, Standard Steel Car Co., Butler, Pa. Recommended by Harry T. Anderson.

Maisch, George J., Division Claim Agent, B. & O. R. R., 712 House Building, Pittsburgh, Pa. Recommended by J. A. Spielmann.

Miller, J. F., Train Master, B. & O. R. R., 615 N. Elm Street, Butler, Pa. Recommended by J. A. Spielmann.

Moore, W. J., Oakland Express & Transfer Co., 229 Atwood Street, Pittsburgh, Pa. Recommended by Joseph Painter.

Myers, Walter H., Shop Clerk, Montour R. R., 1211 James Street, Pittsburgh, Pa. Recommended by F. H. Stark.

McComb, R. J., Representative, The Q & C Co., 1201 Peoples Gas Building, Chicago, Ill. Recommended by C. O. Dambach.

McGinnis, Dio S., Chief Clerk to Special Agent to Federal Manager, Pennsylvania Lines West of Pittsburgh, 3117 Landis Street, Pittsburgh, Pa. Recommended by R. S. Wilson.

McGrann, E. Roy, Assistant Superintendent, McK. C. R. R., 525 Clemesha Avenue, South Hills, Pittsburgh, Pa. Recommended by J. A. Beattie.

McMillan, C. M., G. Y. M., McK. C. R. R., 549 Ringgold St., McKeesport, Pa. Recommended by J. A. Beattie.

Oburg, V. F., Agent, B. & L. E. R. R., East Pittsburgh, Pa. Recommended by R. S. Wilson.

Parker, W. G., Foreman, Material Inspector, N. Y. C. Lines, 3021 Merwyn Avenue, Pittsburgh, Pa. Recommended by K. Berg.

Picard, John J., Work Inspector, P. C. C. & St. Louis Railway Co., 512 East Main Street, Carnegie, Pa. Recommended by W. C. Ayres.

Price, W. F., Chief Clerk, Store Department, Union Railroad Co., 128 Shaw Avenue, Turtle Creek, Pa. Recommended by W. C. Bradley.

Reich, F. C., Yard Master, P. A. McK. R. R., McKees Rocks, Pa. Recommended by A. E. Spear.

Rumpel, Hans, Draftsman, Standard Steel Car Co., Engineering Department, Butler, Pa. Recommended by Harry T. Anderson.

Seubert, Harry J., Clerk, Pittsburgh Construction Co., 808 Diamond Bank Bldg., Pittsburgh, Pa. Recommended by A. R. Frey.

Spence, L. E., Foreman Stores Department, P. & L. E. R. R., 434 Narcissus Street, 20th Ward, Pittsburgh, Pa. Recommended by J. C. Gobrecht.

Stonick, A. E., Assistant General Yard Master, Union Railroad, East Pittsburgh, Pa. Recommended by R. S. Wilson.

Straka, E., Clerk, B. & L. E. R. R., Universal, Pa. Recommended by R. S. Wilson.

Straka, Edward J., Clerk, B. & L. E. R. R., Universal, Pa. Recommended by R. S. Wilson.

Yuengert, L. C., Clerk, Standard Steel Car Co., Engineering Department, Butler, Pa. Recommended by Harry T. Anderson.

West, John W., Gang Foreman, B. & O. R. R., 133 Hazelwood Avenue, Pittsburgh, Pa. Recommended by C. H. Durant.

PRESIDENT: When these applications have been approved, the gentlemen will become members of the Club.

There being no further business, the President introduced the speaker of the evening, Mr. C. W. Price, General Manager, National Safety Council, U. S. Government, upon "Safety From the Standpoint of Industrial Efficiency."

"SAFETY FROM THE STANDPOINT OF INDUSTRIAL EFFICIENCY."

C. W. Price, General Manager, National Safety Council.

Mr. Chairman and Gentlemen: Some eighteen years ago it happened to be my lot to be employed in the factory owned by one of the wealthy families of Chicago, a family known as among the most public spirited in Chicago. And I remember, just before I went to work at this factory that the Company had completed a mill, in which some five hundred girls were employed, and some one hundred and fifty men. This was spoken of at that time as the first model plant in the Middle West; and some said it was the first model textile plant that had been constructed in the United States.

I remember gentlemen, how people spoke of this family, what kind-hearted people they were, to provide such a fine place for those girls and men to work in. But do you know, I can't recall that any one ever intimated, and I know the suggestion never came to my mind, that all of those things, that went to make that mill not only a safe and a healthy place in which to work but a pleasant place, would turn out to spell good business, make dividends, increase the efficiency of the plant.

Now, gentlemen, if I were asked what is the most significant, and to me, the most encouraging thing that has come to me in my eighteen years' experience in the manufacturing world, I would instantly say it is the coming of the idea, the conviction among employers of labor, that everything that makes for the conserving of the human equipment makes money; in the long run, turns out to spell efficiency, and therefore is good business. Some time ago I was in Boston, and while there I called on the proprietor of one of the finest clothing establishments in the East. In fact, I know of no plant I could place with it, except Marshall Field's. I said to the owner, 'I have been interested in your plant for a number of years. You people have done everything to make this plant a safe and healthy and pleasant place. You have even gone further than that. You have organized a mutual association among your employees and that association literally makes the rules and regulations of your store. Now, all this is fine from the standpoint of good ethics; but, does it pay dividends; Is it good business?' He answered: "Mr. Price, at every step of the way it has yielded good returns on the investment, and as I look forward to the conditions of labor that are bound to exist after this war, I believe all of these things we are doing will be increasingly profitable."

Soon after I went to the Industrial Commission of Wisconsin, which was referred to by the Chairman, I went down to Kenosha and called on the President of one of the largest Manufacturing Companies. In the conversation, he made this statement: "I believe the time is fast approaching when it will be no longer possible to realize the revolutionary economies that were realized when, for instance, the process of making steel was discovered, or the application of electricity was developed, or the steam engine was invented. I believe the next great field of economy in industry is the conserving of human equipment." And this man has testified to faith that is in him by making his plant one of the model plants of Wisconsin.

I remember this Company had an old foundry about 400 feet square in which 550 men were employed. The general manager told me it was a common thing at that time for half a dozen men to be overcome by gas. They were pouring those little rosette castings used on cheap beds. Then they spent $46,000 and raised the roof of that foundry to about forty feet in height, installed adequate window space and made it one of the finest factories I have ever seen, from the standpoint of light and air. The Manager told me they at once decreased the number of workers from 550 to 450, increased the output of the foundry and saved the $46,000 the first year.

Now, I want to place before you one or two figures that just in a flash will throw on the curtain what this accident prevention proposition has come to in the United States, because it is accident prevention which is one of the outstanding features of this whole movement. The other day I telephoned to the editorial department of "The News," in Cleveland, and asked them what were the latest figures in regard to the American boys killed abroad, and they gave me these figures:

Of the 2,000,000 American soldiers who went across seas to fight the Hun, 50,000 were killed in battle or died as the result of wounds inflicted on the battlefield during nineteen months, and 182,000 were injured in battle. These figures are based upon the latest reports from Washington.

During that same period of nineteen months, here in peaceful America, 3,000 miles away from the scene of contest, 126,654 men, women and children were killed by accident in the industries, on the streets, and in the homes. Now I don't know how your mind works, my mind fails to visualize 126,654 deaths, but when I say that that means 220 accidental deaths every day during the nineteen months, I commence to get the picture; or to paint the picture more graphically. I was reading the other day how they buried the poor soldier boys over in Flanders. They buried them in ditches, shoulder to shoulder, with their feet across the ditch. I said, "Let us make one funeral of the 126,654 dead and bury them in one trench, allowing two feet per man." I found it made a ditch 48 miles long, and in the bottom of that ditch was a solid sidewalk of the dead bodies of the men, women and children who were killed by accident in the United States during the nineteen months in which we were engaged in the war.

During the nineteen months here in America there were over 2,000,000 men, women and children who were so seriously injured by accident that they lost over four weeks' of time or were permanently maimed.

Now there never was a time when employers of labor, and serious-minded citizens were waking up so fast to what this loss means to industry and to society. I believe it can be truthfully said that this war, with all its loss and suffering, has left every employer of labor in America, whether he be conscious of it or not, with a new thought, a new conviction regarding the value of the human equipment in industry. I believe the remark made to me the other day by the President of a large middle-west industry voices the conviction of all progressive employers when he said, "I believe the next great field of economy in industry is the conservation of the human equipment."

Some months ago a Professor in one of the leading universities of New York City asked a prominent Safety Engineer this question—"What is the one most significant fact which stands out in the last ten years' experience in accident prevention in industry?" The engineer replied, "In my estimation the one outstanding fact is that we have absolutely demonstrated that we can eliminate three-fourths of all accidental deaths and serious injuries in industry." I think this is a very good answer if it is true and it is true, and I shall try to prove it to you in a few minutes.

Then it occurred to me to line up in my own mind some of the other significant facts in this last ten years' history of the safety movement.

In my opinion, the second most significant fact is that accident prevention has offered the first legitimate common ground on which employer and employee can meet with mutual interest and understanding and with profit to both.

Perhaps ranking third is this fact: that according to the experience of hundreds of industrial plants in which accidents have been reduced from 50% to 75%, it has been found that not more than one-third of what was accomplished was made possible by any mechanical guard or mechanical equipment, anything which could be made of iron or wood or steel or purchased with money. Two-thirds has been accomplished through organization and educational methods, through reaching superintendents and foremen and getting them convinced and "on the job," and through them reaching the workmen and getting them intelligently interested in protecting themselves.

The last point which should be mentioned is that every industry which has done efficient accident prevention work has found that it not only pays ordinary dividends, but in many cases extraordinary dividends on the investment and, therefore, Safety is rapidly coming to be recognized as an indispensable part of an efficient shop organization. It is not only good ethics, but it is good business.

Let me tell you the story of the experience of six large representative industries in accident prevention, a story which I believe will prove the truth of the four statements which I have just made.

A few days ago I was in St. Louis, and while there I visited the great steel foundry of the Commonwealth Steel Company employing some 2,500 men. Foundries like this, in which large castings are made ,are generally considered extra hazardous. The General Manager gave me these figures covering their accident experience during the past three years:

In 1916—769 men were injured and lost time,
In 1917—371 men were injured and lost time,
In 1918—124 men were injured and lost time.

During 1918, with 2,500 men working, there were three months during which time not a single man was sufficiently injured to receive compensation under the state laws. In this foundry, with one of the greatest eye hazards I have seen in any industry, they have eliminated serious eye injuries by the rigid enforcement of the use of goggles. The General Manager stated that five years ago they were spending $35,000 to cover loss from accidents; during 1918 the total cost of compensation was $4,500. He remarked, "I have made a larger dividend on my investment in Safety than I have ever realized in making steel castings."

I have followed closely the experience of this company for a number of years, and I happen to know that this splendid achievement is largely the result of an organization of foremen who are sincerely interested in Safety and through these foremen the workmen have been reached and have been convinced of their responsibility in preventing accidents.

Sometime ago I went to Omaha and while there I visited the plant of the American Smelting & Refining Company employing some 1,000 men. This is one of eighteen plants of this corporation. I remember that when I entered the gate that morning I saw a large blackboard located where the men pass on their way to and from work. I noticed that the blackboard was divided into two parts. On the left hand side was the record, month by month, of lost-time accidents for the previous year and on the right hand side was the record for lost-time accidents, month by month, for the current year. That blackboard told the story that, comparing the records of the two years, lost-time accidents had been reduced in that plant ninety percent. But this is the most remarkable story: They made a record of running from September 15th to January 10th, approximately four months, with 1,000 men working under hazardous conditions without a single one of these men being sufficently injured to lose over twenty-four hours of time. I want to say that I have visited a good many plants in which good Safety work is being done, but I have never visited a plant in which there was such an absolute pull-together spirit between the foremen and the workmen as there was in that plant. It seemed to me the day I was there that every man was doing his level best to keep his department on the banner list. I went out of that plant with this thought in my mind: If it can be done in this plant it can be done in any plant, because the inherent hazards of this plant were above the average and the problem was largely a human problem and not a mechanical problem.

The experience of the International Harvester Company is significant because in this great corporation are included coal mines, logging camps, saw mills, railroads, steel mills, foundries, machine shops, wood working plants and twine works, representing practically all of the hazards found in the industries of America. During the first five years' experience in accident prevention work in this corporation, deaths from accidents were reduced 60%. In some of the larger plants, deaths and serious injuries have been reduced over 75%, and in the steel mill, employing 1,300 men, deaths and serious injuries during the first five years were reduced 88%. During 1915 the cost in compensation for all accidents in the twenty-three plants of the International Harvester Co. was only 25 cents on each $100.00 payroll. The total cost of equipping the steel plant with mechanical guards, some $46,000, was covered by the saving in the cost of accidents during the first two years.

A recent statement issued by the United States Steel Corporation, the great pioneer in the Safety movement, reveals the fact that in this corporation, employing in its mines and steel mills over a quarter of a million men, 23,195 men were saved either from being killed or so seriously injured that they were permanently maimed or lost over thirty-five days' time, compared with the record of 1906. The significance of this figure will be suggested to the mind when I say that this represents a city of approximately 125,000 men, women and children, in which city the head of every home, the father of every family, has been saved either from death or serious injury. During that twelve years, beginning with 1907 and ending with 1918, the total saving in cost of accidents compared to the cost in 1906, was approximately $12,000,000, $1,000,000 each year.

In three of the large plants of the Steel Corporation, the South Works and the Gary and Joliet plants of the Illinois Steel Company, located in and around Chicago, during the past twelve years they have reduced deaths and serious injuries over 80% compared with the record of 1906. In the face of war conditions and the most serious labor situation ever known, these plants made a record in 1917 of reducing accidents 37% over the previous year, and in 1918 made a further reduction of 10% over 1917. This remarkable record was made possible by an organization of superintendents and foremen who were absolutely convinced of Safety, and a thorough-going campaign of education which effectively reached every workman.

A few years ago we would have said that the railroads represented one of the most hazardous industries in this country. Do you know that during the last eight years every great railroad in the United States has organized a thorough-going accident prevention movement, and is now pushing Safety with the same brains and backbone that they are pushing anything else which saves waste and makes for efficiency? A report of the Interstate Commerce Commission, covering the first five years' history of this movement ending with June 30, 1916, reveals the fact that during that five years deaths to passengers in train wrecks were reduced 50% and accidental deaths to train operators were reduced 47%. During the year ending June 30, 1916, there were 325 railroads, including some of the largest, with 162,000 miles of track and carrying 485,000,000 passengers, that did not kill a passenger in a wreck. Now any movement which in five years can command the attention of and the support of the managers of the great railroads of this country, must have in it something of unusual worth.

One of the most significant things which has happened during the past year in the Safety field has happened in Allegheny County, including Pittsburgh, where an intensive educational campaign has been conducted by the National Safety Council, reaching all of the industries. Meetings for plant managers, safety engineers and foremen have been conducted, and many thousands of workmen have been reached through moving picture exhibits held in halls and parks. A recent report published by the Department of Labor and Industry includes the statement that in this district, which probably represents the most congested and hazardous industrial district in this country, the lost-time accidents were reduced 33⅓%. The Commission states that this remarkable record is directly due to the splendid campaign which has been conducted by the local organization of the National Safety Council. I give this story because it indicated what it is possible to do through community effort along accident prevention lines.

A few minutes ago, I said that two-thirds of all that has been accomplished in accident prevention was accomplished through organization and educational methods and not by the use of any mechanical equipment. I ought to add here that if you should make an analysis of the accident experience during the past year in the majority of the larger industries which, in compliance with the requirements of state laws and insurance companies, have completed a large percentage of the mechanical safety equipments of the plants, you would find that not more than 15%, and in many cases 10%, of the accidents could have been prevented by any mechanical guard. So you can see the Safety movement is rapidly becoming an educational movement, an effort to reach the rank and file workmen and get them intelligently and sincerely interested in protecting themselves and protecting their fellow workmen.

Now during the next few minutes I wish to outline what I am pleased to call the five indispensable things which must be done in an industrial plant in order to effectively reach the workmen. In outlining these five points I am summing up the experiences of the last ten years, and am indicating the methods which have come to be recognized as standards by practically all Safety Engineers.

What is the first of these five indispensable points? I should say it is this: the manager of the plant, the man at the top, must be absolutely convinced on Safety, must put it on the map in his plant, and must get back of it and stay back of it so unmistakably that not a foreman or a workman will doubt for a moment what he is willing to do to make the plant safe, and what he expects them to do. In my work with the Industrial Comission of Wisconsin and in my field work during the past two and one-half years with the National Safety Council, I have visited a large number of plants in which they were not getting results in Safety work. In every case, without an exception, I found the manager did not really believe in Safety. I do not mean to say that he was indifferent to the welfare of his employees. What I mean to say is that he was not informed in regard to what has been accomplished in accident prevention and the economic saving which has been realized, and therefore, he was treating Safety as an outside matter and not as a dignified feature of an efficient shop organization. The result was that his foremen were indifferent and, of course, the workmen were indifferent.

The second point to be mentioned is this: Every Safety Engineer who is in close touch with the accident experience in his plant is coming more and more to emphasize this one point: the attitude of the workmen toward Safety depends absolutely on the attitude of the foremen. If the foreman is interested, the workman will be interested. I often say to an audience of foremen, 'Do you realize that what the workmen think of the company is what they think of you?' If you are cold and indifferent to Safety, the men will say that the company 'does not care for the lives of their men. There are more men at the gate.' In my work during the last ten years, I have had the opportunity of visiting quite a number of plants, and I have met a great many foremen. I want to say that I have never seen a foreman who was cold and indifferent regarding accident prevention, who had not yet come to realize that Safety is arriving in industry as a part of efficiency and is being recognized by the ablest business men; a foreman who treated Safety as an outside proposition, as a sort of philanthropy; I say I have not seen such a foreman who ever received any co-operation from his workmen in the prevention of accidents. On the other hand, I have never known a foreman who was really a firm believer in Safety; who had come to consider Safety just as he considered any other feature of plant efficiency; a foreman who by what he did to make his department safe and by the honest, earnest way in which he talked to his men every day in regard to their safety, convinced them that he would do everything in his power to keep them from being injured; I have never known such a foreman who did not finally get his men with him in accident prevention.

In every plant, whether large or small, there should be one man, you may call him a Safety Engineer, or Safety Inspector, or you need not call him anything, one man who has been given the opportunity to go out and acquaint himself with the most efficient methods of accident prevention in other plants, and then comes back and is given the time and the authority by the management to look after the hundred and one details regarding mechanical guarding, and especially pertaining to organization and educational methods which the superintendent and foremen cannot attend to. In a small plant such a man would devote part time to accident prevention, and in a large plant he would devote his entire time.

During the summer of 1917, I had occasion to visit all of the Government arsenals and navy yards. In a number of them the Commandants told me that the reason why they had not accomplished more in accident prevention was because they had never had any man who was an expert on the subject and could devote his time to the work. I believe that in accident prevention, just the same as in any other important department of a plant, a competent man must be responsible for the work. This may be included as the third indispensable.

What is the fourth of these five indispensable things that must be done to secure the interest of the workmen? In my estimation it is through the use of bulletin boards. In practically every plant in which efficient Safety work is now being done, a bulletin board is placed in each department. On this board each week are posted bulletins with pictures and stories which drive home what the workman can do to protect himself. Take this picture which I hold in my hand, of an infected hand, showing the result of neglecting a slight scratch on a piece of wire. What foreman has the gift of language to really convince a workman that a slight break of the skin, just enough to draw the blood, may result in blood poisoning and death? A number of companies take photographs of every serious accident and with the proper inscriptions and stories, post them on the bulletin boards. Many companies post other interesting and striking exhibits, for instance, in the packing plant of the Swift & Co., Chicago, a man was working with a mushroom head chisel when a chip flew and destroyed the sight of one eye. The Safety Engineer took this mushroom head chisel and also a chisel of the same size and kind with a properly ground head, and attached them to the bulletin board with a photograph of the one-eyed man and the story, telling how the accident happened, and what the man might have done to save his eye. Bulletins like this serve to keep uppermost in the minds of workmen the importance of Safety.

The last one of the five indispensable things which I wish to mention is one of the most important. In practically all of the industries in which successful accident prevention work is being done, the plan of appointing Workmen's Inspection Committees has been adopted. Sometimes one committee is appointed to cover the entire plant, and in other cases a committee of three workmen is appointed in each department, depending upon the size of the plant and the conditions. These committees are composed of rank and file workmen who are given the time and the authority, once a week or once a month, to go out into the plant and make a perfectly fearless and independent inspection, to discover unsafe practices or dangerous conditions and to report them to their superior officer. The first doubt which arises in the mind of the average man who is not familiar with this plan is this: the workmen will make a large number of suggestions which are foolish and impractical. Now I have made a careful study of Workmen's Inspection Committees, and I have found that from 90% to 95% of the suggestions that are made by committees which are properly organized are found to be practical and are adopted by the company.

The one indispensable thing in making a success of Workmen's Inspection Committees is that the foreman must believe in the committee idea; be convinced that the way to get workmen interested in Safety is to give them some recognition, some responsibility, an active part in the Safety work. The success of the Workmen's Committees will depend wholly upon the careful instruction and constant encouragement and help on the part of the foreman. In order to get the best results from these committees, they should be given a definite time each weeek or each month to make their inspections. The reports should be made in writing and should be submitted to the foreman. If a foreman finds that a suggestion is not practical, he should carefully explain to the members of the committee why it cannot be carried out so that they will feel that he has been fair with them.

The experience of a large number of plants in which Workmen's Committees have been properly organized shows the following three things always result. First: when workmen are given an active part in accident prevention, are given some recognition, and some responsibility, they take a new interest in the work. Second: when the workmen on these committees begin to make an inspection of their department, they discover what the foreman cannot tell them and make them believe, what a large percentage of accidents cannot be prevented by the employer or foremen, but must be prevented alone by the carefulness of the workmen. An important result of Workmen's Committees is that when men have served on these committees for, say, two to three months, which is the usual term, they become the best boosters for Safety and will do much to win the confidence of their fellow workmen in Safety.

When I think of Workmen's Committees, I always recall one story. When I was in Wisconsin with the Industrial Commission, I visited one of the large paper mills one day and met the Superintendent. He told me that he had recently appointed a Safety Inspection Committee of five workmen and he said, "I want to tell you what happened the first hour after this committee started out on its tour of inspection. They came back to my office and reported twenty-eight serious points of danger, on any one of which a serious accident or death might have occurred. I want to show you one of them." He took me down into the basement. The floor of the basement was built over the river and was wet and slimy. As we went down the stairway it was so dark that we could not see our way. When we reached the bottom I noticed on the right hand side a large beam about two feet from the floor, and next to the floor was a three-inch shaft with a large thirty-six inch pully running at high speed, all unguarded. The Superintendent said, "Do you know the committee found that the oiler, every day, had gone down into that dark basement and had crawled under that beam and over that dark shaft, next to the unguarded pully, and then back in the dark to a machine which he oiled, and then made his way back to the stairway? One of the workmen on the committe remarked 'If he had been decent he would have been killed.' "Now I have been Superintendent here eight years, and I never saw it before."

Now, in closing, let me say this: Assuming that what I have said is true that three fourths of all deaths and serious injuries in industries can be eliminated and assuming that it is true that wherever efficient Accident Prevention work is done it always yields not ordinary dividends but extraordinary dividends on the investment, don't you see that comparing the present time with, say, fifteen years ago there has entered into the industrial world a new factor. What I mean to say is that back of this movement, having for its purpose the conserving of human life, is not only the humanitarian impulse but back of this movement is the economic factor; it is not only good ethics but it is good business. Now, with these two powerful motives back of this movement, I believe I am safe in saying that looking forward to the years ahead we have an absolute assurance that the factory of the future is not only going to be a safe place and a healthy place, but even a pleasant place in which human beings may work.

PRESIDENT: I am sure that everybody thoroughly appreciates Mr. Price's address, and that we will all be benefited by what he has said. I think he drove home some thoughts to the "higher-ups" that ought to take root.

Now, we have with us a few gentlemen who have been in safety work on different railroads whom I would like to hear some remarks from. Mr. Price has assured me that he will welcome any questions which anyone wishes to ask. I will therefore allow a few minutes for any of the members who wish to ask questions. I will ask the first question myself: Mr. Price, of all the injuries in the United States, how many were injured in automobile accidents?

MR. C. W. PRICE: I can't tell you. I know that in New York State, in 1918, there were almost a thousand. In New York City there were 500. How many were there in Pittsburgh?

MR. F. H. STARK: One year there were 3,200 killed in Allegheny County.

MR. C. W. PRICE: I know that in St. Louis, where I have just come from, we made a reduction in industrial accidents of 65 per cent. The automobile deaths jumped from

60 to 99. That's what I had in mind: I mean that industrial deaths were cut from 110 to 47, and automobile accidents on the street jumped from 60 to 99. You see what is happening, don't you? I can't give you the total. I have seen it but I don't remember. But I tell you, it is increasing almost in direct ratio to the number of automobiles; because, in the average city, as you will find from the records, the automobiles are increasing about 30 per cent every year, and the accidents are increasing at about the same rate.

MR. A. E. ANDERSON: There are three questions suggested by the remarks of Mr. Price. The first is by way of comparison. It is announced in the papers today that after deducting the moneys loaned to our Allies, we shall have to pay out for the war about $18,000,000,000; and it is figured that by paying a billion and a quarter a year, that amount can be paid in 25 years. Now, it occurred to me while you were talking, Mr. Price, when you gave an estimate of the number of people killed and injured in peace times and while the war was going on, how near to that "peace loss" as we might call it, would we come if they had played safe, and how nearly would this saving take care of the annual war loss of a billion and a quarter of dollars.

MR. C. W. PRICE: Well, let us figure the average cost of loss of a life at $5,000. Taking the deaths alone it would be $630,000,000. That's not saying anything about the 750,000 seriously injured, and the losses there.

MR. A. E. ANDERSON: So that the peace loss would take care of the war loss. Now, the second question is that when you have educated the foreman and the men from the Safety First notion into the Safety Habit, how much is their efficiency increased by freedom from worry and on account of their mental status, so that they can do better work, and do it more easily?

MR. C. W. PRICE: I am glad you asked that question. A good many Doubting Thomases who don't know anything about safety work say that by red tape you are going to interfere with efficiency. But let me tell you that in every plant where they worked out a standard safety organization, with committees, bulletin boards, etc., and have done it in the right way, in every case, instead of interfering with production it has increased efficiency.

MR. ANDERSON: Now, the third question is one prominent in educational circles today, and concerns foreign-speaking workmen who have not yet learned to speak the English language sufficiently that they may understand orders and know what is being done, and what should be done, if anything, by the National Safety Council in having the Government establish rules whereby these men shall be compelled to learn the English language.

An illustration came up in Court yesterday, when Judge Cohen was hearing a case wherein he had to call an interpreter to have the testimony of the witness presented to the jury, and he said that if he were in charge of the matter, he would require that every foreigner coming into this country would be required to learn the English language to the extent necessary for his everyday life, within three years.

Another thing about the relations between employer and employee is that no man likes to work for another, and through his Anglo-Saxon spirit unconsciously resents the fact that he has to accept wages. Now the trouble has often been with foremen and supervisors that they have not handled the men in such a way as to recognize that personality, but have infringed upon it and thereby started trouble.

MR. C. W. PRICE: I remember Mr. Shattock, treasurer of the Campbell & Clark industry, which is one of the largest of its kind in this country, standing up in a paper convention in Milwaukee, and he said "Gentlemen, if the organization of Workmen's Committees in our plants had never prevented an accident, the change which has come about in the attitude of the employers towards the workmen alone has repaid us.

Answering Mr. Anderson's question as to what the National Safety Council is doing along educational lines, I would say that, as you know, we issue bulletins every week, we issue publications frequently on Americanization, stating what the men are doing. We have frequently issued bulletins showing what has been done by these various companies in the first six years of the National Council, and we are more and more doing this sort of thing.

PRESIDENT: We would like to have Mr. F. H. Babcock, who has charge of the safety work on the P. & L. E. R. R., tell us how they take care of these matters on that road.

MR. F. H. BABCOCK: Mr. Chairman, and members of the Railway Club: It is indeed very gratifying to hear Mr. Price state to you men the wonderful results being accomplished by this movement, particularly in Allegheny County.

I presume that we are all concerned in accident prevention work in Allegheny County, and I, for one, am very glad to say to Mr. Price that in at least portions of this county we are interested in this work. I am not very much at boasting, but I believe our little P. & L. E. R. R. is in the A class in accident prevention work, not only in Allegheny County but in the adjoining territory through which our road runs.

As to Workmen's Committees, I believe that we keep pace with the rest of the corporations, and I don't know of anything which Mr. Price has said regarding accident prevention work that we are not fulfilling our obligation in the same to its limit. We are keeping constantly, everlastingly at it, and I want to say, through our earnest endeavor during the year 1918 we have succeeded in reducing our death roll four men and 505 personal injuries over 1917.

Now, the question was brought up by a gentleman here a few minutes ago as to what part, financially, accident prevention would play in paying the war debt. I don't believe, however, that anything was said as to what financial gain would be made if an accident was prevented. For instance, gentlemen, you know that when a man has started in to learn his trade and reaches that highest point of efficiency as a journeyman, and when he becomes injured at that time it is necessary to fill his place, and we all know what it means to place a new man on the job. It means that the company is going to be placed at unusual expense to bring that man up to the point of efficiency where the old man left off; therefore, I say that when an accident is prevented this is another item which may be credited towards the payment of the war debt.

Now, I want to say to Mr. Price and to you gentlemen, that we on the P. & L. E. Railroad have entered another field of endeavor in the promotion of this safety work, and that is by taking this message right into the lodge rooms of the Brotherhood organizations. Our superintendent has taken the matter up with the various Brotherhood organizations, and has had favorable replies from each one of them, to the extent that I have had a very pressing invitation to come and address these meetings. I have already addressed five Brotherhood organizations—the Brotherhood of Locomotive Engineers, three lodges of the Brotherhood of Railroad Trainmen, and one lodge of the Brotherhood of O. R. C., and I have now standing on my docket three invitations to address three organizations in the next few weeks.

Now, gentlemen, I am going to tell you something about our endeavor to get this Road into the organizations. In the first place, as no doubt you all know, we have had more or less difficulty in conveying this lesson to the individual on the job, because there are certain elements which are indifferent about this thing. But by meeting these men right on their own grounds, right in their homes, face to face, and there discussing the matter of safety, we have overcome a great deal. Of course, they expect me to talk and give them the benefit of my knowledge as I get over the road and learn these things, and after I get through we enter into a general discussion on the work, and every man in the lodge room has a voice in it. A question comes up for instance, as to conditions along the road, such as dirty yards, drawheads, ties, and all kinds of material lying between the tracks; and we convince these men that we are doing everything we can to keep these yards clean. And I want to tell you that when these men go out of the lodge rooms, they do so with a better conception than they ever had before, because we have met them on their own ground.

We are getting good results from our bulletin boards, and do not depend entirely upon the bulletins issued by the National Safety Council. Of course, they are pictorial bulletin boards—the picture tells the story; but aside from that we put out our own local bulletins. For instance, if a man is killed through some accident which might have been prevented, we put out a local bulletin on that, describing the entire question of accident and also personal injuries of any consequence. And by that you see we disseminate this knowledge. Five years ago the man on the other end of the road didn't know what was going on at this end, and the result was that perhaps John Jones, a friend of Bill Smith, might have been killed and John Jones not know anything about it. But we cooperate in carrying the news right straight along and carrying on the work in that way. I thank you.

PRESIDENT: Are there any further remarks on this very interesting subject by any of the members?

MR. F. H. STARK: I am very sorry that I cannot add anything of a constructive nature. Unfortunately, I am forced to take the defensive. As a matter of fact, the Company which I represent has been slow to take action. Soon after the Safety First movement was launched, we felt that only corporations earning large dividends could afford to take up this work, and then too, we thought a company with only 500 employees was not large enough to specialize along this line, and we were prone to allow the larger interests to do the missionary work. In the meantime, various corporations started their Safety First organizations and the results most apparent were signs placed conspicuously, reading "Safety First." Then too, the term Safety First was used as an advertising medium with a tendency to commercialize it, which to some of us it apperaed to be over-worked, and would soon become a dead letter.

The speaker of the evening has given us a new vision which should appeal to employers as well as employees, and with his broad experience he is in a position to give us facts which are convincing.

There are two or three reasons why we did not take up the Safety First work, and then too, during the war, we were absorbed with many responsibilities and while other companies were organizing Safety First committees, we deferred action for the reason that we were quite sure that the Committee would uncover so many conditions which ought to be corrected that it would embarrass us. So, we still continued to delay the matter. I believe that Mr. Price has struck the key-note when he emphasizes the importance of Safety Committees, securing the co-operation of the rank and file of the workmen and at the same time encouraging the men. There is one feature about the Safety work that ought to appeal to young men, and without reflecting upon the speaker of the evening, I refer to the possibility of a young man becoming a Safety Engineer even though he may not have had a college training. As I understand it, the qualifications for a Safety Engineer are originality and tact and that these can be developed by application.

Mr. Price's talk has been instructive and of the many good points, I desire to refer particularly to the thought that Safety increases the length of natural life, which is of vital importance. There is also a responsibility that goes with life, and that is the use we make of it. Therefore, it is up to every man here to contribute his share, and more particularly during this critical period.

PRESIDENT: We have one more speaker, and then we will proceed to the pictures. We will now call upon Mr. Rasmussen.

MR. W. R. RASMUSSEN: Mr. President and Gentlemen: There was one question asked here tonight which I am glad to have the opportunity to answer: "Does Safety interfere with operation?"

The day that I left the American Smelting and Refining Company, at Omaha, I went to the general manager and told him there was only one thing I wanted. I wanted him to tell me whether the safety work we had done in the plant had interfered in any way with production. He said "I don't mind giving you that." Then he called in the business manager and told him he wanted certain statements. These statements proved that production had been increased, on a percentage basis, 12½ per cent in two years' time. "Now," he said: "I can't say that it is all due to safety work, but safety work did not interfere with production. I will say that."

I want to say this to you, gentlemen: If there are any of you trying to get safety committees organized and started on your lines, if the Western Pennsylvania Division can assist you in any way, I hope that you will call on us. Our office is in the First National Bank Building, and we are always looking for something to do. We are always ready to help you at any time we can, we are at your beck and call.

PRESIDENT: I had intended to call upon the representative of the National Tube Company, but there have been so many nice things said about them, and inasmuch as they are going to furnish the pictures, we will have to be satisfied with that. In the meantime, I want to explain that Mr. Speller, who was to present this address with the moving pictures, is unable to be here, and the National Tube Company will therefore be represented by Mr. Brackenridge, who will put the pictures on the screen.

MR. J. G. CODE: Mr. Price talks of this being an educational question. It has never since I have known it—and that is for a number of years—come nearer reaching 100 per cent in its educational ideal than in the talk which we have heard tonight. And I feel that every man present will be very forcibly impressed and helped in his interest in safety work by the emphasis laid upon the fact that the realization of results in safety work is to such a large extent an educational and a human, rather than a mechanical proposition.

I move, you Mr. Chairman, that we give to the speaker a rising vote of thanks for his excellent talk.

A rising vote of thanks was extended the Speaker.

(Motion Pictures were shown by Mr. Brackenridge,

representative of the National Tube Co):

"From Ore to Finished 'National' Pipe."

PRESIDENT: I think we have all enjoyed these moving pictures. It was through the kindness of Mr. Jerry Beatty, General Superintendent of the Monongahela Connecting Railroad, that we were enabled to secure them, and I think we are indebted to him as well as to Mr. Brackenridge.

MR. L. H. TURNER: The Railway Club of Pittsburgh has always endeavored to be educational. It has been our privilege to attend a great many meetings, but I believe none were more instructive or more entertaining than we have had tonight.

I want to offer a motion tonight to thank the National Tube Company, and particularly Jerry Beatty, for having arranged for the display of these pictures; and also to thank

Mr. Brackenridge for having come here and shown them to us.

Motion seconded and carried.

There being no further business, the meeting adjourned at 11 P. M.

J. D. CONWAY, Secretary.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912,

Official Proceedings Railway Club of Pittsburgh, published nine issues a year, at Pittsburgh, Pennsylvania, for April 1, 1919.

State of Pennsylvania, } ss.
County of Allegheny, }

Before me, a Notary Public in and for the State and county aforesaid, personally appeared J. D. Conway, who, having been duly sworn according to law, deposes and says that he is the Secretary of the Official Proceedings, Railway Club of Pittsburgh, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations.

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher, Official Proceedings Railway Club of Pittsburgh.
Editor, J. D. Conway, 515 Grandview Avenue, Pittsburgh, Pa.
Managing Editor, J. D. Conway, 515 Grandview Avenue, Pittsburgh, Pa.
Business Managers, J. D. Conway, 515 Grandview Avenue, Pittsburgh, Pa.

2. That the owners are: (Give names and addresses of individual owners, or, if a corporation, give its name and the names and addresses of stockholders owning or holding 1 per cent or more of the total amount of stock.)

NONE

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are:

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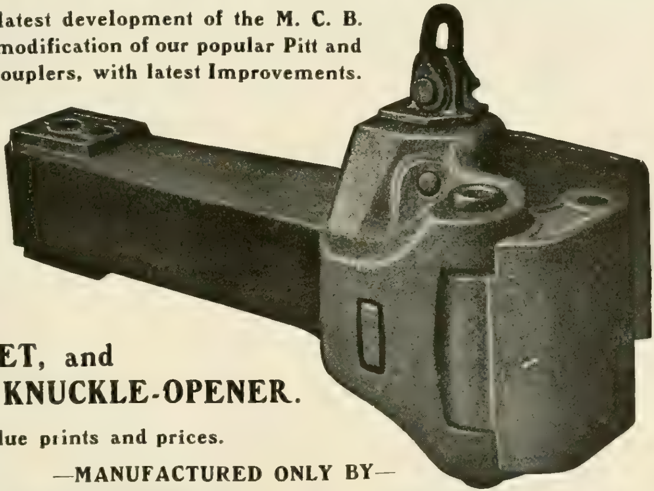

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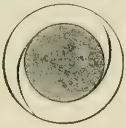

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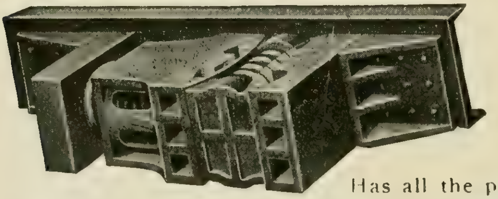

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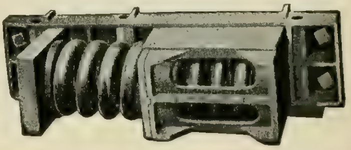

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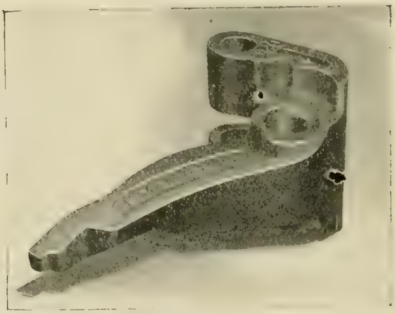

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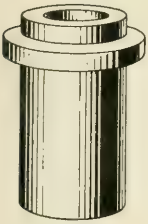

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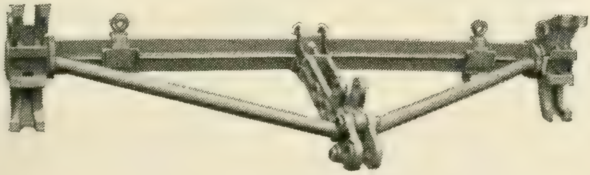

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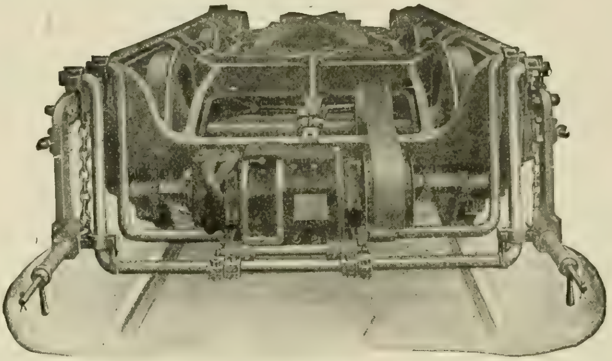

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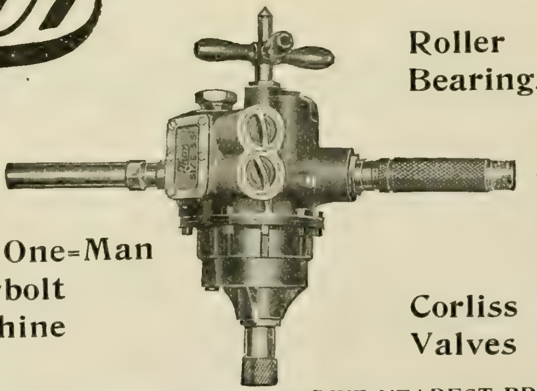

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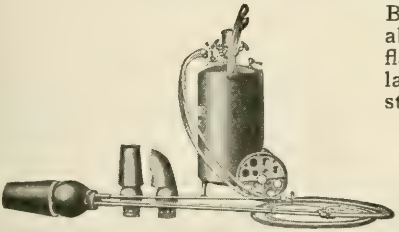

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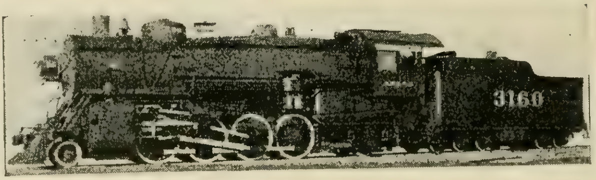

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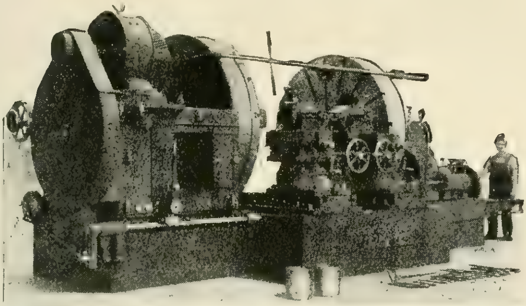

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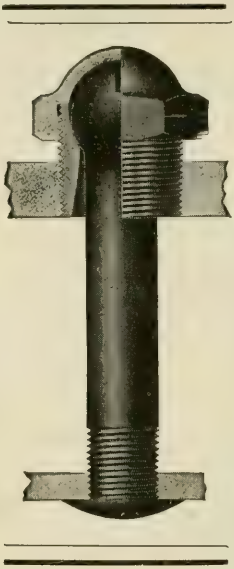

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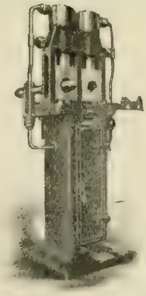

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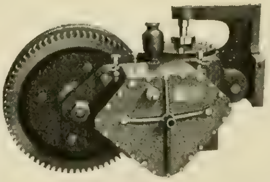

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RAILWAY CLUB NOTES.

The following subjects were presented and discussed by the several Railway Clubs during the month of March, 1919, as noted below:

New York Railroad Club, Harry D. Vought, Secretary,
95 Liberty Street, New York, N. Y.

SUBJECT—"Supply Men's Night"—Speakers, A. L. Humphrey, Wm. E. Woodward and Dr. W. F. M. Goss.

New England Railroad Club, Wm. E. Cade, Jr., Secretary,
683 Atlantic Avenue, Boston, Mass.

SUBJECT—Annual Meeting—Election of Officers, etc.

Richmond Railway Club, F. O Robinson, Secretary,
Richmond, Va.

SUBJECT—Not received.

St. Louis Railway Club, B. W. Frauenthal, Secretary,
Union Station, St. Louis, Mo.

SUBJECT—"Unification of Telegraph and Telephone" by F. E. Bentley, Supt., Tel., St. Louis-East St. Louis Ter. Dist.

Southern & South Western Railway Club, A. J. Merrill, Secretary,
Box 1205, Atlanta, Ga.

SUBJECT—"Safety" by T. R. Jones, Supervisor of Safety, Central of Georgie R. R. Co.

Central Railway Club, Buffalo, N. Y., Harry D. Vought, Secretary,
95 Liberty Street, New York, N. Y.

SUBJECT—"Unification of Inspection and Maintenance of Car Equipment" by J. J. Tatum, General Supervisor of Car Repairs, U. S. Railroad Administration.

Canadian Railway Club, James Powell, Secretary,
P. O. Box 7, St. Lambert, near Montreal, Can.

SUBJECT—"Varnish Making" by Norman Holland.

Pacific Railway Club, Wm. S. Wollner, Secretary,
64 Pine Street, San Francisco, Cal.

SUBJECT—Annual Meeting—"Accidents at Railroad Grade Crossings," by Will S. Corbin, Locomotive Engineer, South Pacific Co.

The Railway Club of Pittsburgh, J. D. Conway, Secretary,
515 Grandview Avenue, Pittsburgh, Pa.

SUBJECT—"Locomotive Operation—Uniform Instructions" by J. R. Alexander, General R. F. of E., Pennsylvania R. R. Co.

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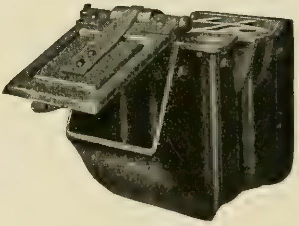

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OF

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Organized October 18, 1901.

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Vol. XVIII. No. 4. **Pittsburgh, Pa., Mar. 27, 1919** $1.00 Per Year 25c Per Copy

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Past Presidents

J. H. McCONNELL	October, 1901, to October, 1903.
L. H. TURNER	November, 1903, to October, 1905.
F. H. STARK	November, 1905, to October, 1907.
* H. W. WATTS	November, 1907, to April, 1908.
D. J. REDDING	November, 1908, to October,1910.
F. R .McFEATTERS	November, 1910, to October, 1912.
A. G. MITCHELL	November, 1912, to October, 1914.
F. M. McNULTY	November, 1914, to October, 1916.
J. G. CODE	November, 1916, to October, 1917.
D. M. HOWE	November, 1917, to November, 1918.

* Deceased.

Meetings held fourth Thursday of each month, except June, July and August.

THE RAILWAY CLUB OF PITTSBURGH

"RESOLVED, by The Railway Club of Pittsburgh, that any of its members who have now, or who may, during the present World's War, become one of our Country's defenders by joining the Military or Naval Forces of the United States, or who by reason of membership in the American Red Cross, or other Associations in connection with War Activities, are called away from home, shall be exempt from dues and continued as members in good standing until their return home from the War, and that the Secretary shall prepare a Roll of Honor showing such members for the records of the Club."

—ROLL OF HONOR—

ATTERBURY, W. W., Vice-President, Penna. R. R., Broad Street Station, Philadelphia, Pa. (Brigadier-General, Director General of Transportation, American Expeditionary Forces.)

BAKEWELL, DONALD C., Asst. Treas., Duquesne Steel Foundry Co., Pittsburgh, Pa. (Captain, Ordnance Dept., Chicago, Ill.)

BRASHEAR, DR. JOHN A., 1954 Perrysville Avenue, N. S., Pittsburgh, Pa. (National Research Council, U. S. A.)

BROWNSCOMB, G. J., Clerk, Union R. R. Co., East Pittsburgh, Pa. (Canadian Regiment, overseas.)

BUELL, D. C., Director, The Railway Educational Bureau, Omaha, Neb. (Lieutenant Commander, U. S. Navy, Ordnance Department.)

CHRYSTAL, W. A., Bookkeeper, Montour R. R., Pittsburgh, Pa. (Headquarters Company, 319th Infantry, Camp Lee, Petersburg, Va.)

CONNER, WILLIAM P., Efficiency Inspector, P. R. R., Monongahela City, Pa. (Lieutenant, Co. A, 54th Engineers, American Expeditionary Forces, London, England.)

CUNNINGHAM, R. I., Mechanical Expert, W. A. B. Co., Wilkinsburg, Pa. (First Lieutenant, 31st Engineers Reserve Corps, American Expeditionary Forces.)

DEAN, RANDOLPH F., Signal Repairman, P. C. C. & St. Louis Railway, 729 Washington Avenue, Carnegie, Pa. (Battery 4, R. O. T. C., Military Branch, Chattanooga, Tennessee.)

ELLIOT, A. H., Representative, American Brake Shoe & Foundry Co., Philadelphia Pa. (Captain, Engineers Reserve Corps, American Expeditionary Forces.)

FARQUHAR, L. C., Allegheny Steel Co., Pittsburgh, Pa. (First Lieutenant, Ordnance R. C.)

GYLLENFLYCHT, T. E., Draftsman, Pressed Steel Car Co., 1012 Criss Street, Sheridan, Pa. (Captain, 53d Regiment, U. S. Infantry, Chattanooga, Tennessee.)

HEWITT, ELLIS E., Draftsman, W. A. B. Co., Wilmerding, Pa. (Cadet, Air Service, Fort Monroe, Va.)

HOOVER, F. M., President, Hoover & Diggs Co., Pittsburgh, Pa. (Overseas Duty, Y. M. C. A.)

HOTT, G. H., Assistant Yard Master, Monongahela R. R. Co., Brownsville, Pa. (Corporal, Supply Company, 330th Infantry, Camp Sherman, Ohio.)

HOWE, HARRY, Inspector of Castings, Pressed Steel Car Co., McKees Rocks, Pa. (Captain, 107th Field Artillery Supply Company, Camp Hancock, Georgia.)

HUFF, GEORGE F., JR., Assistant Road Foreman Engines, Pennsylvania R. R., Harrisburg, Pa. (Captain, 19th U. S. Engineers (Railway) American Expeditionary Forces.)

KATZIN, WILLIAM, Draftsman, Pressed Steel Car Company, 701 Broadway, McKees Rocks, Pa. (Private, Company E., 319th Infantry, Camp Lee, Va.)

LINDNER, W. C., Foreman Car Repairs, Penna. R. R., 2125 Union Avenue, Altoona, Pa. (Captain, E. O. R. C. 35th Engineers (Railway) Camp Grant, Ill.)

LOCKWOOD, CHAS. H., Draftsman, Pressed Steel Car Co., 366 Lincoln Avenue, Bellevue, Pa. (Second Lieutenant, 7th Battalion, Infantry Replacement Camp, Camp Lee, Va.)

MASON, R. L., Railway Material, Pittsburgh, Pa. (Y. M. C. A. work in France.)

MAXFIELD, H. H., Supt. Motive Power, Penna. R. R., Pennsylvania Station, New York, N. Y (Colonel, 19th U. S. Engineers (Railway) American Expeditionary Forces.)

MORRIS, H. W., Purchasing Agent, Pittsburgh & West Virginia Railway, 115 Belmont Avenue, Crafton, Pa. (First Lieutenant, Ordnance Department, Production Section, Carriage Division.)

MORRIS, J. M., Assistant Master Mechanic, Penna. R. R., Verona, Pa. (First Lieutenant, E. O. R. C., 35th Engineers (Railway) Camp Grant, Ill.)

MURPHY, PAUL F., Civil Engineer, Penna. R. R., Aspinwall, Pa. (First Class Machinist Mate, Naval Reserves, 2nd Naval District, Newport, R. I.)

RAMBO, R. E., Civil Engineer, P. R. R., Pittsburgh, Pa. (223d Squadron, Aviation Camp, Waco, Texas.)

RICHERS, G. J., Assistant Master Mechanic, Penna. R. R., Verona, Pa. (First Lieutenant, Headquarters Detachment, 15th U. S. Engineers, American Expeditionary Forces.)

ROBBINS, F. S., Assistant Master Mechanic, Penna. R. R., 28th Street, Pittsburgh, Pa. (Captain, 19th U. S. Engineers (Railway) American Expeditionary Forces.)

SMITH, CHANDLER P., General Manager, P. L. & W. R. R., Lisbon, Ohio. (First Lieutenant, Company 3, E. O. R. T. C. Engineers.)

STORRS, CHARLES P., Manager, R. R. Dept., Storrs Mica Co., Owego, N. Y. (Lieutenant, U. S. Navy.)

STRAUB, V. V., Salesman, Star Brass Manufacturing Co., 104 E. Dedham Street, Boston, Mass. (Private, Signal Corps, School for Officers, Camp Kelly, Texas.)

WHITMAN, E. B., Assistant Road Foreman of Engines, Penna. R. R., Pittsburgh, Pa. (Captain, 19th U. S. Engineers (Railway) American Expeditionary Forces.)

WILLIAMS, HAROLD S., Stenographer, Pressed Steel Car Co., 99 South Grant Street, Bellevue, Pa. (Private, 35th Engineers (Railway) Camp Grant, Ill.)

WIPPERMAN, F. B., Traveling Engineer, Ohio Injector Co., 1437 Monadnock Block, Chicago, Ill. (First Lieutenant, E. O. R. C., Company B, 311th Engineers, Camp Grant, Ill.)

NOTE—In order to keep the above Roll of Honor correct to date the Secretary will be glad to be advised of any additions or corrections thereto.

PROCEEDINGS OF MEETING,

MARCH 27, 1919.

The meeting was called to order in the Americus Club House, Pittsburgh, Pa., at 8 o'clock, P. M. Vice-President Frank J. Lanahan in the chair, in the absence of the President.

The following gentlemen registered:

MEMBERS.

Adams, L.
Alexander, J. R.
Allen, H. L.
Amsbary, D. H.
Anderson, A. E.
Angell, C. P.
Beals, R. E.
Berghane, A. L.
Blakley, T. M.
Bond, W. W.
Bowden, T. C.
Burel, W. C.
Burket, C. W.
Cartwright, Wm. E.
Cassiday, C. R.
Christy, O. B.
Collins, W. H.
Conway, J. D.
Courtney, D. C.
Cox, Wm. C.
Crenner, J. A.
Croft, E. B.
Cunningham, H. R.
Dambach, C. O.
Dudley, S. W.
Durant, C. H.
Eckroate, W. H.
Finney, H. F.
Forrest, C. H.
Gellinger, C. W.
Gibson, D. W.
Glassburn, S. G.
Gobrecht, J. C.
Grewe, H. F.
Grieve, Robert E.
Griffin, J. J.
Haynes, J. E.
Heineman, H. D.
Herlihy, J. J.
Hoffman, C. T.
Holbrook, W. H.
Howe, D. M.
Huber, H. G.
Johnson, A. B.
Jungbluth, A.
Kelly, H. B.
Kinch, L. E.
King, C. F., Jr.
Lanahan, F. J.
Laughner, C. L.
Lawson, A. F.
Laylin, M. H.
Lloyd, J. A.
Lobez, P. L.
Lynn, Samuel
Maisch, Geo. J.
Marshall, W. T.
Matchett, H. K.
Merscher, John
Moore, D. O.
Moyer, Oscar G. A.
McAbee, W. S.
McDowell, D. W.
McElheny, M. L.
McGrann, E. Roy
McMillan, C. M.
Newburn, T. W.
O'Connor, M.
Parke, F. H.
Patterson, J. E.

Pfeil, John
Proven, John
Redding, D. J.
Richardson, C. A.
Robeck, Geo. B.
Robey, T. H.
Sattley, E. C.
Scheck, H. G.
Seibert, Wm. L.
Severn, A. B.
Sewell, H. B.
Smith, John L.
Smith, J. L.
Spielmann, J. A.
Spindler, D. G.
Sponsler, W. L.
Stark, F. H.
Stombaugh, J. C.
Strome, H. H.
Stucki, A.
Suhrie, Norman
Thomas, E.
Tutwiler, L. H.
Waggoner, R. E.
Walther, G. C.
Washburn, A.
West, John W.
Wolf, H. M.
Wright, John B.
Wyke, J. W.

VISITORS.

Barnhart, B. F.
Barrett, R. L.
Barrett, T. W.
Bhomof, J. A.
Brand, H. B.
Burns, C. R.
Carruthers, G. R.
Christley, J. F.
Compton, C. C.
Compton, V. C.
Corns, A.
Darrah, C. B.
Dewson, E. H.
Donaldson, Harold R.
Downs, J. J.
Drebert, E. H.
Gilmore, J.
Gilson, George I.
Guthrie, Edw.
Hawkins, M. E.
Hitchcock, F. A.
Karner, L. L.
Long, Edw.
Luchtemeyer, H. L.
MacFarland, W. E.
Malone, Richard
Miller, John M.
Mitchell, A. L.
McCarthy, W. T.
McKenzie, E. F.
McNamara, J. V.
Nicholas, Arthur D.
Ogawara, Tok.
Sellman, P. D.
Shaffer, B. C.
Shaffer, D. L.
Spicer, A. F.
Strople, G. H.
Suesserott, J. L.
Swanson, J. M.
Walker, J. W.
Ward, N. H.
Williams, A. P.

The call of the roll was dispensed with, the record of attendance being shown by the registration cards.

The reading of the minutes was dispensed with as they will appear in the printed Proceedings.

The Secretary read the following applications for membership:

Barnhart, B. F., Act. R. F. of E., B. & L. E. R. R., 57 Chambers Street, Greenville, Pa. Recommended by T. H. Robey.

Barrett, T. W., Superintendent, B. & O. R. R., 430 Summit Street, Mt. Oliver Station, Pittsburgh, Pa. Recommended by J. A. Spielmann.

Barratt, R. D., Car Inspector, Monon. R. R. Co., 1513 Sheridan Avenue, S. Brownsville, Pa. Recommended by D. H. Kinter.

Beals, Robert E., Engineer, U. R. R., 240 W. Swissvale Ave., Edgewood, Pa. Recommended by J. E. Patterson.

Bergin, William D., Car Foreman, B. & O. R. R., 1607 Broadway, Beechview, Pittsburgh, Pa. Recommended by J. A. Spielmann.

Bonifield, Charles P., Car Foreman, B. & O. R. R., 4715 Blair Street, Hazelwood, Pittsburgh, Pa. Recommended by J. A. Spielmann.

Boughner, Arthur G., Supervisor Train Operations, B. & O. R. R., Box 266, Confluence, Pa. Recommended by J. A. Spielmann.

Brand, H. B., Superintendent, Boilers, Mesta Machine Co., 637 Seventh Avenue, Homestead, Pa. Recommended by D. H. Amsbary.

Brennan, Jesse Sheldon, C. C. Superintendent Transportation, B. & O. R. R., 312 B. & O. Passenger Station, Pittsburgh, Pa. Recommended by J. A. Spielmann.

Bricker, H. P., Chief Labor Agent, B. & O. R. R., 1601 McCulloh Street, Baltimore, Md. Recommended by J. A. Spielmann.

Broderick, John T., Superintendent, Safety and Welfare Department, B. & O. R. R., Baltimore, Md. Recommended by J. A. Spielmann.

Burns, C. R., R. F. of E., Baltimore & Ohio R. R., 507 Green Street, Connellsville, Pa. Recommended by W. C. Burn.

Charlton, W., F. C. I., Monongahela Railway, Second Street, S. Brownsville, Pa. Recommended by D. H. Kinter.

Donahoe, F. F., General Supervisor, B. & O. R. R., 428 Mansion Street, Pittsburgh, Pa. Recommended by J. A. Spielmann.

Donaldson, Harold R., Motive Power Inspector, P. R. R. Co., Room 203 Pennsylvania Station, Pittsburgh, Pa. Recommended by M. J. Hepburn.

Downs, J. J., Train Master, B. & O. R. R., 331 S. Negley Avenue, Pittsburgh, Pa. Recommended by J. D. Conway.

Drebert, E. H., General M. M., Superior Steel Corporation, 525 Main Avenue, Carnegie, Pa. Recommended by D. H. Amsbary.

Easton, J. McF., M. M., Pittsburgh Spring and Steel Co., 127 Vara Street, Mt. Oliver Station, Pittsburgh, Pa. Recommended by John Proven.

Eckroate, W. H., R. F. of E., W. & L. E. R. R., 603 Fourth Avenue, Massillon, O. Recommended by M. H. Laylin.

Eves, R. W., Power Plant Supervisor, B. & O. R. R., 123 Haberman Avenue, Mt. Washington, Pittsburgh, Pa. Recommended by J. A. Spielmann.

Forney, H. L., Master Carpenter, B. & O. R. R., 130 Hazelwood Avenue, Pittsburgh, Pa. Recommended by J. A. Spielmann.

Harn, Chas. B., Conductor, Monongahela Railway, 1109 Second Street, S. Brownsville, Pa. Recommended by D. H. Kinter.

Harsh, H. H., Division Engineer, B. & O. R. R., Room 401 Water Street Station, Pittsburgh, Pa. Recommended by J. A. Spielmann.

Heineman, H. D., Yard Master, B. & O. R. R., 233 West Pearl Street, Butler, Pa Recommended by J. A. Spielmann.

Hum, David, Jr., Secretary, Bertha Coal Co., 1203 Chamber Commerce Building, Pittsburgh, Pa. Recommended by J. A. Spielmann.

Jamieson, R., Carpenter Foreman, B. & O., 137 Hazelwood Avenue, Pittsburgh, Pa. Recommended by J. A. Spielmann.

Johnson, J. W., Superintendent, American Railway Express Co., 332 South Linden Avenue, Wilkinsburg, Pa. Recommended by C. P. Angell.

Johnson, Wm. I., A. R. F. of E., Pennsylvania R. R., 1914 Pine Avenue, Altoona, Pa. Recommended by R. E. Grieve.

Karner, Leslie L., Tender Foreman, B. & O. R. R., 5307 Second Avenue, Glenwood, Pittsburgh, Pa. Recommended by W. C. Burn.

Lamm, H. S., Assistant District M. P. Clerk, B. & O. R. R., 210 Grandview Avenue, Mt. Washington, Pittsburgh, Pa. Recommended by J. A. Spielmann.

Lear, C. V. Terminal T. M., B. & O. R. R., 740 Climax Street, Pittsburgh, Pa. Recommended by J. A. Spielmann.

Long, Edward, A. R. F. of E., Pennsylvania R. R., 521 N. Maple Avenue, Greensburg, Pa. Recommended by R. E. Grieve.

Long, H. P., Assistant Car Foreman, B. & O. R. R., 4715 Blair Street, Hazelwood, Pittsburgh, Pa. Recommended by J. A. Spielmann.

Lowney, J. L., Secretary to General Superintendent, B. & O. R. R., care General Superintendent, B. & O., Pittsburgh, Pa. Recommended by C. H. Durant.

Magill, W. E., C. F. A., B. & O. R. R., 106 N. Fremont Ave., Bellevue, Pa. Recommended by J. A. Spielmann.

Malone, Richard, R. F. of E., N. Y. C. R. R., 38 Nathan St., Ashtabula, Ohio. Recommended by John L. Smith.

Mitchell, Alfred L., Chief Smoke Inspector, P. R. R. Lines East, 1105 Burns Street, Wilkinsburg, Pa. Recommended by Wm. McCauley.

Mullen, Thomas J., Secretary to General Superintendent, B. & O. R. R., 130 Wabash Avenue, Pittsburgh, Pa. Recommended by J. A. Spielmann.

McCarthy, W. T., Fuel Inspector, W. & L. E. R. R., 416 Bell Street, Massillon, Ohio. Recommended by M. H. Laylin.

McElroy, Samuel, Special Agent, B. & O. R. R., 238 Laughy Street, Pittsburgh, Pa. Recommended by J. A. Spielmann.

McGaughey, John V., A. R. F. of E., Pennsylvania R. R., Conemaugh, Pa. Recommended by R. E. Grieve.

McGregor, D. C., Supervisor, B. & O. R. R., 420 Mansion Street, Pittsburgh, Pa. Recommended by J. A. Spielmann.

McGregor, S. S., Assistant Engineer, M. of W., Union R. R., 109 Mifflin Avenue, Wilkinsburg, Pa. Recommended by W. C. Bradley.

McNamara, John V., Smoke Inspector, P. & L. E. R. R., 2845 Carson Street, West Pittsburgh, Pa. Recommended by A. R. Thurlby.

Nelson, W. O., Assistant Division Engineer, B. & O. R. R., Room 401, B. & O. R. R. Depot, Pittsburgh, Pa. Recommended by J. A. Spielmann.

Peeples, L. F., Car Foreman, B. & O. R. R., 227 Lawell St., E. E., Pittsburgh, Pa. Recommended by J. A. Spielmann.

Peters, W. B., Agent, B .& O. R. R., 309 Eighth Street, Braddock, Pa. Recommended by J. A. Spielmann.

Rackliffe, Charles R., R. F. of E., B. & O. R. R., 1227 Sycamore Street, Connellsville, Pa. Recommended by W. H. Collins.

Stombaugh, Joseph C., Instructor of Fireman, P. R. R., Derry, Pa. Recommended by R. E. Grieve.

Stone, C. M., Assistant Superintendent, B. & O. R. R., 211 Lincoln Avenue, Connellsville, Pa. Recommended by J. A. Spielmann.

Suesserott, J. L., Field Engineer, B. & O. R. R., B. & O. Station, Pittsburgh, Pa. Recommended by J. A. Spielmann.

Swift, Thomas O., Operator and Clerk, B. & O. R. R., 1101 Trenton Avenue, Wilkinsburg, Pa. Recommended by J. A. Spielmann.

Ward, N. H., R. F. of E., P. & L. E. R. R., 3222 Sacramento Street, Pittsburgh, Pa. Recommended by A. R. Thurlby.

Welty, C. L., Locomotive Engineer, B. & O. R. R., 4742 Sylvan Avenue, Pittsburgh, Pa. Recommended by W. H. Collins.

Burtoft, J. N., Yard Master, B. & O. R. R., 168 Marsdon Avenue, Pittsburgh, Pa. Recommended by C. H. Durant.

VICE-PRESIDENT: When these applications have been approved by the Executive Committee the gentlemen will become members without further action than the payment of one year's dues.

The Secretary desires information as to the correct mailing addresses of the following members: E. K. Conneeley and N. M. Grafton.

VICE-PRESIDENT: If there is no further business, the next order will be the paper of the evening. We are to have the pleasure of listening to a very interesting paper by Mr. J. R. Alexander, General Road Foreman of Engines, P. R. R., on "Locomotive Operation—Uniform Instructions."

LOCOMOTIVE OPERATION — UNIFORM INSTRUCTIONS.

1. Locomotive and train employes should be sufficiently interested in their buisness to know something about the greatest single item of expense for materials involved in operating a railroad. As for illustration, for locomotives on the Pennsylvania Lines East for the year 1916, the coal consumed represents approximately 9,592,125 tons, at a cost of $12,676,037.01 for the 4,400 locomotives in actual service during the same period. With this number of boiler plant units running around the country, in charge of as many two men crews, it would be a surprise if the Company did not

collect and furnish everybody interested with the best and most correct information to insure efficient and economical performance; not, however, for the purpose of entertainment, but rther to do their part and help you and me to be everlastingly on the job, not only as good enginemen and firemen, but as well for any work requiring supervision, men are so appointed with a view of securing expert teachers in the art of firing and handling of locomotives, and when the situation is sized up correctly, it will be realized to be a man's job to be successful in teaching other men to do the right thing at the right time. Keep in mind that the average man has a curious instinct inhereted from their ancient ancestors so that if not soon told (WHY) to do a certain thing he is apt to work out some theory of his own with rather extraordinary bad results.

2. There are probably many engineers and firemen who, on account of some self-evolved theories, believe that it is proper to have the boiler always full of water and to carry a heavy fire. These incorrect conclusions are generally formed during the first few months of service, which is the habit-forming period, during which time somebody older in the service should start them right by proper instructions of both the "WHY" and "HOW" to best do their work. The point is, therefore, well taken, that there will always be some firemen who are better than others, some enginemen who are more expert than the rest. Those who are not so well equipped should constantly try to equal the performance of the best men, and the poorest men should receive the most attention and encouragement in this effort. The matter of education from a railroad man's point of view should be strictly along the lines of definite instructions and supervision, with strong emphasis placed on supervision, and where this is done within reasonable and practicable limits, to that extent there will be more general prosperity to all interested in the railroad business.

3. Co-operation between the Road Foreman of Engines, Instructors, enginemen and firemen, is the key note of success under all operating conditions, such as engine handling, signal observation, firing, boiler feeding, coal and water saving, as well as all other details in the operation of railroads.

The entire subject of locomotive maintenance and operation should be given such study and attention as will enable them to at all times be familiar with the standard arrangement of grates, front and appliances and all working parts of the different types of locomotives in service, so that in the event of bad locomotive performance or accidents, their investigation will definitely determine the cause and responsibility of the failure and what action, if any, should be taken to prevent a recurrence or to improve the operating conditions, and furthermore, the good or bad locomotive performance records issued from time to time may be considered as an index of the efficiency, or lack of same, on the part of the Road Foreman and Staff, along the lines of imparting instructions to employes, as well as to the extent of supervision and support given to the requirements of the Motive Power Department from those higher up on their respective divisions.

4. It is therefore the duty of every employe to keep everlastingly after all the information available to improve their own work, and that of those with whom they come in contact, with the single purpose of operating locomotives and trains to the best possible advantage. With this in view those interested should read and study all available literature on railroad subjects; in fact, some roads do, or at least the various Railroad Associations study and discuss papers and reports covering all kinds of special apparatus and appliances concerning railroad maintenance and operation, so that without question it is well worth any man's time and attention to take an active interest in some one or more of these side lines in the Railroad business.

5. Those interested or responsible for locomotive maintenance and operation, should be able to understand and read the diagrams of a steam cylinder indicator. It is, however, to be regretted that there are now so few opportunities for the operating man to make use of this device to determine the actual condition of parts effecting the economy of steam distribution, especially with the present large types of locomotives. It may frequently occur that engines when working hard are notoriously bad actors where the sound or time interval between the steam exhausts will be fairly regular and uniform. In many such cases the proper use of a steam

cylinder indicator will usually locate and possibly be the best means of quickly correcting some of the most serious and unaccountable causes for bad engine performance.

6. Those in supervising positions must be expected to take a personal interest in the training of new men and to make clear to all concerned that the rules and methods to be enforced in the handling and firing of locomotives, are based on actual experience, gathered from every available source and carefully selected to obtain the best results, and not on theory or the opinion of any one man. Keep in mind that good supervising does not require stirring up a continual agitation and disturbance among or with the men. It should be the other extreme. The supervising staff should all be diplomats in striving to bring about, without friction, the best possible conditions in locomotive and train service and make the effort to do eevrything that is right and fair to make men more content, which will tend to insure having a larger number of well instructed and efficient long service men. To this end start right, when employing new men, by taking a few minutes time to explain some of the advantages of their new position and the good points of the work and of the men with whom they come in contact.

6-A. New men for a time are nothing but an experiment and it requires big money and lots of work to instruct and bring up each man to the point where he is any good as a railroad man, and again, where men are satisfied with their working conditions, there will be little difficulty experienced in holding them, as well as to give all needed attention to proper instructions concerning the running or firing of a locomotive. It has been said, however, that under the pooling system, the average engineman or fireman gives the subject of locomotive maintenance little or no attention. This is surprising in the extreme, if only from the selfish standpoint of the labor involved during a trip or day's work. The facts are, without fear of successful contradiction, that when locomotives are handled and fired in accordance with correct principles, it will be found the most economical and always the easiest way to do the work and secure the desired results. In this connection, keep in mind that each shovelful of coal wasted represents a direct loss of both labor and money, and that the same practice many times repeated, quickly means dollars to the Railroads, and to the employe much unnecessary work performed with the shovel, and in the frequent cleaning of fires and use of scraper or fire hook while on the road.

7. To explain the A. B. C. operation of a locomotive for the benefit of new men, it might be well to make a word picture to show that a locomotive consists of a boiler having an internal furnace, called the fire box, mounted on suitable frames and on driving wheels, connected by rods and cranks to the two steam engines, acting alternately one on either side, in pushing or pulling the drive wheels around, thus the simple to and fro, or reciprocating motion from the steam piston working in the cylinder, is transferred by suitable guides, rods and cranks to the rolling motion of the wheels, which in turn moves the engine and train forward or backwards, as may be desired.

8. The admission of steam from the boiler to the steam chest of the engine is controlled by a throttle valve in the boiler, operated from the engine cab, and from the steam chest to the cylinders at proper intervals by the turning of the driving wheels which moves the valve gear and the valves; the period of time steam is thus admitted and discharged from the cylinders, and the direction of movement of the locomotive, is governed by the reverse gear. The water to generate steam is furnished to the boiler from an enclosed cistern on the tender, by means of injectors, and a supply of coal for combustion in the fire box is carried in a suitable coal space on the tender attached to the engine.

9. To generate steam in a boiler, the fire requires a proper combination of two elements, coal (carbon) and air (oxygen) either one being of equal importance, except that the air must be furnished in much larger quantities. This must be secured in locomotive service, as in all other furnaces, by what is called "draft" either natural or forced. In theory, natural draft is what is recognized as gravity, which inserts a pull on everything toward the earth, or the other way around, when the air, which weighs approximately 15 pounds per square inch, is heated, it expands, and being lighter will have a tendency to rise through the surrounding

colder air in the stack or chimney of a furnace, leaving behind a partial vacuum towards which the colder air follows. This routine of natural draft is what supports combustion when the locomotive engine is not in any way using steam, and prevents the flame and gases from escaping out of the openings at the fire door.

9-A. To furnish steam in the boiler to haul the train, makes it necessary to provide a means for creating a terrific heat in the fire box, and as the ordinary or natural draft, by means of a high chimney, cannot be used, as with boilers for stationary engines, the forced draft had to be resorted to, which is generated in the smoke box at the opposite end of the boiler from the fire box, by exehaust steam as it issues from the cylinders at the end of each stroke after having performed its work in moving the engines. The escaping steam is led upward through a short pipe in front of the boiler tubes and directly under the stack, through which it passes, drawing with it gases from the smoke box, this in turn creating a partial vacuum in the smoke box, tubes and fire box, so that air is drawn from the ash pan through the grates and fire. For simple type locomotives this exhaust steam passes through the stack four (4) times for each revolution of the driving wheels, so that it can be readily understood that the draft is proportionate to the amount of steam admitted to and exhausted from the cylinders; that is, when but little steam is used, there is but a light draft through the fire, and when more steam is used, the draft is proportionately increased. In this way the necessary draft is established and maintained to suit the constantly varying working of the engine.

10. To provide a draft on the fire when the engine is not working or using steam, a simple arrangement called the blower, is used. This consists of a pipe from the boiler to one or a series of openings around the top of the exhaust steam passage in the smoke box, the flow of steam through which is controlled by an operating valve in the cab. When in use, the steam passing up the stack from the blower outlets has a continuous effect in producing draft similar to that of the exhaust steam. This arrangement is one of the most useful and abused devices found on a locomotive. For all

ordinary purposes the valve should be opened enough to admit an amount of steam through the pipe which will create a light and steady pull or draft on the fire and direct the surplus gases in the fire box toward the flues and stack. The general practice is, however, to always open the valve wide, which pulls a great amount of air through the fire or in at the open fire door. This practice is especially objectionable, and from observation the cases are few and far between where the traveling expert or engineman make any effort to improve the method of operating the blower valve. This matter should receive the attention its importance would warrant.

10-A. For locomotive service, the draft on the fire is controlled by the combined arrangement of stack, nozzle, deflector plate, and netting located in and commonly called the front end arrangement, as shown on standard tracings. These fixtures must be so regulated and maintained as will best suit the kind of coal furnished and the character of service to which the engine will be assigned, and while the several parts should be so adjusted as will insure a uniform draft through all the boiler tubes, it should be kept in mind that where the requirements are severe, or a high superheat temperature desired, the adjustment should be such as will give a strong pull through the upper section of tubes, in order to burn an active and bright fire at the back end of fire box. Furthermore, frequent and careful inspection must be made to see that these appliances are in good condition and that there are no steam leaks at any of the superheater units, steam pipes or exhaust column joints, and that no air can leak into the smoke box around the pipe connections, or front ring or door of smoke box.

11. That part of the fireman's work of "firing" is for the sole purpose of generating heat to boil water in the boiler. All this steam, less the amount required to operate the air compressor, steam heat apparatus, injectors, and by steam leaks, including that so frequently wasted at the safety valves, should be used by the engine in pushing the pistons through their cylinders to make the driving wheels go around, after which the steam is exhausted out of the stack and lost in the air and serves no further service except where the

sound of the exhaust may indicate the condition of valves and cylinder packing, adjustment of valve gear and whether or not the engine is being properly handled and fired. In order to so regulate the fire to produce the varying quantities of heat required, it is important that enginemen and firemen have a correct understanding of what is good practice in feeding water to the boiler by the proper handling of injectors, throttle and reverse lever.

11-A. Prior to starting on a trip, the engine preparers or the firemen, or both, should examine, see and know that the grates, after being shaken, are placed level and the rigging connected to the shaker properly connected to the operating lever in the cab; that the fire is free from ash and clinkers and properly prepared; that the ash pan is clean and the drop doors securely fastened in the closed position. It should also be known that the cistern is full of water, the engine provided with tools, supplies, sand and coal, the coal being properly trimmed on the tender and wet with water when weather conditions permit, and the deck always kept clean. While at engine terminals or when leaving storage tracks or sidings, there should never be more than scant water and steam in the top gauge cock, this to permit the clearing of valves and cylinders of condensation through the open cylinder and port cocks, before moving the engine, as well as to have the opportunity to operate and test the injectors and to prevent loss of water due to steam blowing off at safety valves.

12. Bituminous coal is made up of carbon, gaseous and earthy matter. The process by which the carbon and gaseous matter in the coal are combined with oxygen in the air causes heat and is known as combustion. When the heat is sufficient to cause a temperature of between 1,000 and 1,800 degrees Fahrenheit, the carbon and gases ignite and burn away, leaving the earthy matter as ash or clinker.

13. For laboratory work relating to the chemistry of engineering, bituminous coal is defined as a compound substance, consisting chiefly of carbon and hydrogen, which are the elements performing the most important functions in the combustion of fuel and are referred to in books and data reports by symbols taken from the first letter of the name,

also with a number attached, which indicates the combined weight of the different elements, as for example, Oxygen, O_{16}, Carbon, C_{12}, Hydrogen, H_1, Nitrogen, N_{14}, or thus, one atom of oxygen combined with one of carbon makes Carbon Monoxide, written as CO, having a heat value of 4,500 B. T. U. per pound. Two atoms of oxygen combines with one of carbon and forms Carbon Dioxide, written $C. O._2$, having a heat value of 14,500 B. T. U. per pound.

a. A heat unit written B. T. U. is the quantity of heat required to increase the temperature of one pound of water one degree Fahrenheit at ordinary temperature, as per example, from 39 to 40 degrees Fahrenheit.

b. The temperature at which the hydro-carbon gases given off from bituminous coal commences to burn is between 1,000 and 1,800 degrees Fahrenheit. Approximately the highest temperature obtained in the fire box of a locomotive burning bituminous coal is from 2,500 to 3,000 degrees Fahrenheit.

c. Where one pound of carbon properly unites with 2⅔ pounds oxygen, they generate 14,500 units of heat, or sufficient to raise 85 pounds of water from about 40 degrees Fahrenheit to 212 degrees Fahrenheit, its boiling point, or when one pound carbon unites with only one-half as much oxygen, 1⅓ pounds, it will form carbon monoxide and generates only 4,500 units of heat, and will evaporate but 26½ pounds of water.

d. Air by volume is composed of about 20% oxygen and 80% nitrogen, the proportion of weight being about the same.

e. At about 62 degrees Fahrenheit one pound of air occupies 13.14 cubic feet of space at atmospheric pressure.

f. At ordinary atmospheric pressure, water boils at 212 degrees Fahrenheit.

g. The earth is surrounded with an atmosphere from 45 to 50 miles in height, and at sea level has a pressure of 14.7 pounds, this pressure performing important functions in the combustion of fuel.

14. The burning of coal in a locomotive fire box requires air, which must be admitted through the grates and the fire door. Under these conditions, when coal is thrown on the

fire, the first result is to reduce the temperature, then heat the coal, when the lighter volatile gases are set free quickly, so that more air is needed just after firing than later, otherwise these gases will be wasted in the form of smoke escaping from the stack. The best results are obtained when the air supply is even and just sufficient to combine enough oxygen with each of these elements to burn them. If the air supply is insufficient, the volatile gases will escape without being burned, and if too much air is admitted it will lower the temperature in the fire box and retard combustion. As for example, it is known that from 150 to 300 cubic feet free air is required to burn one pound of good coal, and to this end the exhaust steam passing through the stack should and will draw the required amount of air through the grates and fire, where the exhaust nozzle is of proper size, the flues and grates clean, the front end arrangement of proper design and no air leaks in the smoke box, and the engine properly handled and fired.

15. Fire box temperature can be approximately determined by the experienced men from the color of flame and bed of fire on the grates, governed to some extent by the following table, which may generally be accepted as giving the colors corresponding to the different degrees of heat volume:

Dull red heat..................	1,000	degrees	F.
Bright red	1,800	"	"
White heat	2,300	"	"
Bright white heat.............	2,800	"	"

16. The following table will show the composition and heating value of some of the different kinds of coal used on locomotives in the Pittsburgh District:

Location	Fixed Carbon Percent	Volatile Matter Percent	Moisture Percent	Ash Percent	B. T. U. per Found
Westmoreland Co. Pa.	58.02	31.50	1.20	9.19	14,140
Westmoreland Co. Pa.	56.55	34.77	1.13	7.55	14,427
Westmoreland Co. Pa.	57.25	31.95	0.82	9.98	14,104
Cambria Co. Pa......	67.13	25.75	.95	6.17	14,987
Butler Co. Pa........	51.85	35.75	1.24	11.16	13,563

17. To maintain a good fire in a locomotive boiler requires the exercise of good judgment on the part of both enginemen and firemen to insure constantly keeping up the required general conditions in the fire box; that is, first, the proper distribution of coal over the fire; second, the necessary air supply, and third, to bring these two elements together at a sufficiently high temperature to burn, which is called "Igniting Temperature." Therefore, while engine is working, a practical effort must be made to always have a LIGHT FIRE, a LEVEL FIRE and a BRIGHT FIRE.

17-A. When coal is first put on a fire, it at once commences to absorb heat, which, for the moment, reduces the amount of heat available for making steam. The first tearing down process begins when some of the lighter gases are roasted out of the coal at a temperature of about 800 degrees "Fahrenheit," which is below the igniting point of combustion. However, under actual firing conditions the temperature is quickly raised to or above the igniting temperature, which is about 1,800 degrees "Fahrenheit," and where sufficient air is admitted through a bright fire, the carbon combines with the greatest possible amount of oxygen and produces the greatest amount of heat, called carbon-dioxide (CO_2) (equal to 14,000 B. T. U.)

When the gases combine with an insufficient amount of air it burns as carbon-monoxide (C. O.) which mixture produced only 4,500 units of heat. In each case the same amount of coal will be burned, but, by reason of bad firing conditions, only about one-third the amount of water will be boiled into steam, which in turn means less hauling capacity of the locomotive and more physical labor to perform the same work. This lesson may be made clear to say that a good bright fire requires the burning of more air than coal, and that the air is free and easy to secure, while the coal costs money and much hard labor all along the way from the mine to the consumer.

18. To maintain the fire in proper condition, fresh coal should never be placed on black spots or in holes where it may reach the bare grate. Aim to keep the fire level and bright over the entire grate surface. The least labor and most economical practice is to fire in a leisurely manner,

placing each shovelful of coal where most needed, that is, spotting the coal over the thin and bright spots on the grate surface. If the fire shows bright in some places and dark in others, it should be understood to indicate that the coal at the dark spots has not yet been burned and does not require more fuel at that particular time. Keep in mind that fresh coal first cools the fire, and when bright always gives off the most heat and boils the most water. This is one of the most important features of good firing, and its observation should always be required. While usually more coal must be placed along the sides and at the corners, not the least advantage in keeping a light, level and a bright fire, consistent with the work to be done, is that much less coal must be placed over the front portion of grates by physical strength with the shovel, for the reason that the uniform draft through the fire, enroute to the flues through the openings between flue sheets and brick arch, in combination with the slope of the grates, will gradually assist in pulling the coal to the front end of the fire box.

18-A. The placing of the door against the latch between each shovelful placed on the fire, is to be recommended as the best known means to quickly burn the hydro-carbon gases and avoid excessive smoke, especially at points where smoke restrictions are in force. However, for the protection of boiler seams and tubes, care should be exercised not to permit the door to be one-half or full open when running, except as necessary to swing open and close the door between each shovelful of coal.

18-B. While it is a more or less common practice to fire a large number of scoopfuls of coal at one opening and closing of the fire door, this is a wasteful method when carried to the extreme. There can, however, be no serious objections to placing two (2) to four (4) shovelfuls of coal at each firing where the service requirements are severe, and the work is done properly and promptly. The swinging of the door between each shovelful is to be recommended as the best plan to avoid getting too much coal on the fire. In other words, when firing, it seldom, occurs that the fire becomes too light, but more often by reason of rapid firing, the fire becomes too heavy, thereby causing unnecessary work to maintain the desired steam pressure.

19. The thickness of the fire should be determined by experience and character of the coal used, together with the knowledge of the draft arrangement in the front end and the kind of work required of the locomotive. Keeping these several factors in mind, in advance of the requirements, it is practical to maintain, under all conditions of service, a LIGHT, NEARLY LEVEL and a BRIGHT FIRE, which is essential to insure all the air necessary to support combustion of bituminous coal, to enter through the openings in the grates, and to this end the following general rules will apply.

A. The fire should be LIGHT, as the amount of air that can be supplied from the ash pan through the grates, is limited.

B. The fire must be LEVEL, in relation to its depth on the grates, in order to obtain an equal pull of air over the entire area of the grates.

C. The fire should be BRIGHT, as that is the only way to maintain the temperature in the entire fire box above the igniting temperature of the gases.

20. To maintain this desirable condition in a manner that will insure the coal being properly burned with a minimum amount of labor, is to keep in mind and practice the following simple instructions, which are as applicable for the old cook stove or furnace at home, as for the fire box on a locomotive.

1st. The ash pan is provided to carry the ashes.

2nd. The fire box, (grate) is the place to maintain a bright fire.

3rd. The tender is the place to keep the required supply of coal. In other words, the ash pan and grates should be clean or cleaned when engine is prepared for service, after which the shaker grates should be used as may be required to insure the ashes being deposited in the ash pan, and on modern type engines it is important to keep the flat surfaces on sides of ash pans cleaned off. The proper use of the shaker grates, in combination with proper firing conditions, will also serve to prevent the formation of large clinkers in the fire. To allow the ashes and clinker to accumulate on the grates will later involve much hard work using the scraper or hook to puddle the fire in a vain effort to enable the air necessary to support combustion to pass through the fire, consequently burning and wasting an excessive amount of coal on the road, as well as when cleaning fires at terminals. The proper opening and closing of drop grates, shaking of grates and cleaning of ash pan wings are matters which do not receive sufficient attention from engine crews or engine preparers. These parts should be examined and cleaned frequently while on the road in order to insure the proper amount of air passing from the ash pan through the fire.

a. The greater the amount of coal that is left on tender, under normal or known conditions, at end of trip or day's work, is evidence of the proper handling and firing of the engine for the quantity of coal consumed, and water evaporated, per locomotive, car or ton mile, while on the road.

21. Firemen Instructors should make every effort to assist Engine House people in having the instructions in force carefully followed covering the proper cleaning and banking of fires, and to see that the fires are properly prepared for the work required of the engine, in that way avoiding the frequent and wasteful practice of firemen breaking down banked fires an unnecessarily long time before leaving storage tracks. It should be understood the extent of attention given to maintaining fires while at terminals will largely determine the success secured in the efforts to overcome the smoke nuisance at terminals, and to keep within the many legal restrictions prohibiting black smoke when passing through cities and towns along the line.

a. In most cases sufficient attention is not given to the condition of fires when brought into terminals for cleaning or removal of fire. It is without question a wasteful practice to arrive at ash pit tracks with green coal on the fire. It is equally wrong to have such a heavy fire when approaching terminals as to make it necessary to use the scraper or hook to try and burn up the unburned coal; do not forget that the hostler or fire knocker has a hard job and a hot one to clean or remove a big hot fire. In some cases it is necessary to work the engine close up to the terminal, while at other points there may be long descending grades where the engine is not using steam, except where necessary to maintain the proper operation of the air compressor. Therefore, the methods to be used in approaching terminals may vary considerably, but the one to be followed in each case is that which will insure not having a too much bright fire on arrival.

b. Furtherfore, where proper arrangements are adopted at enginehouses for the cleaning and banking of fires, it is believed they can be prepared and maintained in such a manner as will avoid the necessity of firemen breaking down or leveling the fire before leaving storage tracks enroute to passenger stations or freight yards. This is a matter worthy of the attention of the proper representatives of the Master Mechanic and Road Foreman of Engines.

22. Instructors should, when advisible, demonstrate proper methods of firing, but more especially take advantage of every opportunity to call the attention of new firemen, and others as well, to any errors in practice when preparing a fire for service or while firing on the road, that tends to increase the physical labor involved, which in turn is known from experience to result in bad fires, with more or less variation of steam pressure.

a. Instructors while on engines in motion, must avoid overmuch conversation with enginemen or firemen, especially while running over track where the movement of train is controlled by signal indications. This detail of the work is one that can easily and may no doubt be frequently overdone, in fact, outside of teaching a new fireman how to swing the shovel and use of the firing tools, there should be mighty little talk about anything while running over the road. At that time what is wanted is quick action and results, and to that end the good teacher is more likely to impart all needed information by a few pantomime gestures. The time and place for educational work should be at the Motive Power Instruction Room or Car, supplemented by such action while in service as will bring about no criticism concerning the safe movement of the train.

b. It will be found that the good and experienced fireman will usually stand in a position to the left side of the fire door, facing the right, or engineer's side of cab, far enough away from the boiler to avoid discomfort from heat from the fire when door is open, then to handle the shovel between coal on tender and the fire box (preferably with coal kept well forward) as will permit using the right hand for the push, pull and swing of the loaded shovel from the coal pile to the fire and return of empty shovel to the tender. This should be done with little or no lifting or sliding movement of the feet from the floor of cab or apron, and at the same time the left hand should keep hold of the fire door chain, swinging the door shut and then open while pushing the shovel into the coal and again getting ready to lift the loaded shovel to the open fire door. By this method the heavy carrying of coal is distributed and better equalized throughout the entire body without unnecessary exertion of the arms, shoulders or legs of the fireman.

23. Where brick arches are maintained, great care must be exercised to avoid the coal, after leaving the shovel, striking the arch, falling down and banking over the center portion of the grates, thereby allowing the fire to burn out over the forward section of grates. Another condition of bad firing under the control of fireman, which frequently results in poor engine performance, is due to the large accumulation of cinders and partly burned coal found on top of the arch, same being conclusive evidence of improper handling of the shovel when placing coal on the fire. Trouble from this source may be serious and can be avoided by following proper instructions in handling the shovel to maintain the fire nearly level and keeping the back corners of fire box well covered with good active fire. Under certain conditions it may be good practice to place the fire coal at back end of fire box and the lumps forward, but where brick arch is not used, the reverse would be more correct.

24. The shaker grates and lever must be maintained in good condition and used frequently, preferably with short quick jerks of the lever, rather than a full throw, except when cleaning a very dirty fire. The front section of the grates usually require more shaking than the rear portion

by reason of the restricted space between the grates and the brick arch in the front of the fire box, which makes it more necessary to avoid an accumulation of ashes on the grates. The proper use of the shaker grates, in combination with proper firing conditions, will largely serve to prevent the formation of large clinkers in the fire.

24-A. Fire or hot cinders in the ash pan will warp and burn out the side and bottom sheets, drop doors and grates. On some types of engines this may be cause for heating of rear driving axle bearings. When necessary to dump fire on main or side tracks, the hot ashes and fire must be extinguished by water. After cleaning out ash pan, the drop doors or slides must be closed and securely fastened.

25. After properly fixing up the fire, the frequent use of scraper or fire hook must be discouraged, and but little will be required where sufficient interest is taken during the trip to maintain a light, level and bright fire. Under ordinary and the usual conditions, the use of the scraper or fire hook while engine is working, except where used as a feeler, and not to tear up the fire, is proof positive of bad firing practice, due either to want of proper knowledge of the subject or interest in the work.

26. For locomotives, especially those with wide fire boxes, in hard service, it may be considered good practice to fire more heavy along the sides and back corners and light in the center, but for want of proper instructions, firemen frequently form the habit of firing all to the right or to the left side, thereby causing trouble by reason of building a too heavy fire on one side, while too light on the opposite side of the fire box. Great care must be exercised to avoid these extremes by frequently examining the fire. This can be done by turning the shovel upside down for a few seconds inside the open fire door, which will deflect the air currents and clear away the smoke from a portion of the fire, as it may not require the use of the scraper or fire hook, or only to place one or two shovelfuls of coal on the thin and bright spots over the entire grate surface.

26-A. Where the fire burns evenly, the method called "cross firing" may be followed, that is, placing a shovelful in regular order to the different corners, front and back portion, of the fire box. While this may be correct in theory, it is still essential and of first importance to learn to fire on the bright spots, indicated by the color of the flame, to determine where fresh coal should be placed, all of which will tend to minimize the variation of steam pressure or eliminate trouble from honey combing of flue ends and sheets. This tube sheet cinder, which occasionally forms over the end of tubes, is a combination of silica (sand) iron, pyrites, sulphur and lime. The formation of this pasty mesh is mostly due to the iron in the ash, in combination with moisture sometimes contained in the coal, or by reason of the tubes or tube sheet leaking slightly, or from bad leaks from blower pipe in front end, or from the excessive wetting of coal with the sprinkler hose.

27. Heavy or so-called rapid firing, will be found unsatisfactory when using either lump or fine low volatile coals, and always results in the fire becoming too thick on the grates and brings about a condition where not enough air can be supplied to burn the volatile gases which are quickly liberated from the coal. The statement is sometimes made that heavy fires must be maintained by reason of the fine coal furnished. The facts are, the reverse is more nearly correct where, by reason of fine or poor coal, a light, bright thin fire will insure more perfect combustion and minimize the accumulation of ash and clinker, while under the same conditions with a too heavy fire, the fine coal will pack and prevent the free passage of air through the fire, consequently resulting in too much smoke, less steam and more clinker. These unburned gases represents a combination that absolutely wastes about 20% of the fuel, in addition to the rapid formation of clinker and ash that tends to reduce the efficiency of the fire. This condition of fire can and should be recognized by the engine crew or observer by the dull red color of the flame and from the amount of dense black smoke emitted from the stack, or when the shovel is turned over and used to lift the fire next to the door, the dull red or bright fire can be seen under the unburned coal, which immediately bursts into flame, thus showing that combustion has been seriously retarded. This red hot condition under the

banked portion of the fire is largely the cause of large clinkers being formed. Furthermore, the bad practice of heavy and rapid firing of coal causes a considerable part of the solid carbon to be burned as carbon monoxide, with a noticeable reduction of superheat temperature, whereas, under more favorable conditions, and by reason of sufficient air being supplied, all gases would be burned as carbon dioxide, and a corresponding higher temperature of the superheated steam.

27-A. A heavy fire restricting the amount of air passing through the fire will permit the monoxide gases entering the tubes instead of being burned over the grates. On superheater locomotives, a heavy fire, or even where too much coal is placed on the fire, always brings about lower superheat and a great reduction in the efficiency of the engine. On the other hand, not the least advantage of having a light, level and bright fire, is to provide the intense heat necessary to burn up the carbon and keep it from forming a scale over the tubes, thereby increasing the steam pressure in the boiler and as well the superheat temperature in the cylinders. This truth can be proven on any old cook stove at home, where a heavy fire will make a red flame and deposit much soot (carbon) on the lids and inside of draft pipe, but with a light bright fire, this accumulation of soot and scale will burn off, leaving the iron clean.

27-B. Stoker firing is a mechanical means for carrying a light, level and bright fire, especially desirable for securing maximum performance of large types of locomotives. These machines must be operated and so regulated by the engine crews to always maintain the proper condition of fire, which means that before leaving enginehouse tracks, the stoker machine should be carefully inspected, oiled and placed in good operative condition. Any accumulation of ashes should be removed from the grates and the fire built up by shovel firing. It is, however, a more general practice to attempt to use the stoker machine for building up or rebuilding fires at engine terminals. This method may be subject to some adverse criticism and will be found wasteful on account of the cold arch and the amount of good coal or fire falling through the grates. It will be found advisable to use the shovel to maintain fires until starting with train from terminal. Further, by reason of carrying a light fire, the shaking grates should be used more with a view of keeping the fire clean, or, rather to prevent the ashes forming into large clinkers which interfere with the free passage of air, which in turn largely defeats the proper distribution of coal over the fire by means of the steam jets and distributor, this rather than to clean the fire after it becomes full of ashes and clinkers. As a general proposition this attention to grates should be given when approaching or at coaling stations so that the ash pan can at the same time be cleaned in order to prevent the accumulation of ashes and hot fire collecting in the shallow parts of the ash pan and burning out or causing serious damage to the grates before reaching the next stopping point.

27-C. For stoker firing, the presence of objectionable and an excessive amount of black smoke from the stack indicates either too heavy firing or bad draft arrangement of the engine, which results in the fine coal becoming tightly packed, thereby restricting the free passage of air through the grates.—A successful stoker fireman must always be on the lookout to keep the machine properly lubricated.—To watch the condition of fire.—To not open slides too wide and overload conveyor with coal, causing machine to stall.—Do not feed too much coal, carry a light fire.—To watch for and remove foreign matter entering the hopper with the coal.

To close the tank slide opening before taking coal; preferably these slides should be closed when nearing terminal and the driving engine run long enough to remove all coal from the conveyor.—Before stopping driving engine, especially in cold weather, see that the drain cocks are open or that the automatic cocks, where provided, function properly. —At terminals, place conveyor reversing lever in neutral position.—Report all defects and trouble on the road to the proper authorities for attention.

27-D. In connection with the instructions to always admit a small amount of steam to the steam cylinders when drifting or stopping trains, care must be exercised to have sufficient water in the boiler so that almost as soon as the steam throttle valve is closed, both the injector and stoker machine can be stopped. Otherwise, should the injector continue to feed water into the boiler when engine is not using steam, or when the blower is not used and the fire properly maintained by shovel, the closing down of the stoker will cause the fire to cool quickly and the temperature to reduce rapidly resulting in extreme contraction causing leakage to fire box and tube sheets. It is also important that the parts requiring lubrication be given attention regularly in order to insure proper and continuous operation. It must be understood that a stoker failure due either to a machine breakdown or clogging of the conveyor, usually results in a bad train detention, and which, most often, more correctly speaking, are due to a man failure.

27-E. There will be less difficulty in having enginemen and firemen give this matter attention when they once realize that the very heavy firing of coal is objectionable—and the cause of bad fires and frequent steam failures. In many cases what is wanted is not more coal but more time and better conditions to burn the fuel previously placed on the fire, or again, after the use of the scraper or fire hook, that usually brings dense black smoke from the stack, the sure result is for the volatile gases and moisture to collect on the surface of the netting in the front end, and while this smudge may remain there either temporarily or permanently, the draft on the fire to that extent is lessened and tends to reduce steam pressure and make more work for the fireman. In other words, the more smoke out of the stack, the less draft, and in turn, less air going through the fire to make an efficient gas producing furnace out of the fire box.

28. To the other extreme where the fire is too light in spots for the work, the exhaust or draft will pull such a large volume of air through the thin spots as will bring considerable of the burning gases below the igniting temperature. This unnecessary air passing through the fire like a blizzard, wastes heat trying to raise the surplus air up to igniting temperature, and again, while there may be no black smoke, there are other practical objections to the cyclonic passing of excess amounts of air through the fire, in that, the swift rush of the gases lifts the small particles of fine coal and carries them directly into and through the tubes so rapidly that no time is given to burn the coal or heat the

air, and results in a large volume of unconsumed gases passing into the stack, than would be if the movement of the air and gases were more properly restricted. Where little or no air passes through the heavy banked portions of the fire, the carbon or hydro-carbon is wasted for want of sufficient oxygen. Therefore, the condition of fires known as heavy banked, or too thin, to the extreme either way, results in seriously affecting the maintaining of uniform steam pressure and should be understood to be very hard on the up-keep of a boiler, by reason of the excessive strains set up with the sudden and possible extreme variation in temperature.

28-A. In districts where black smoke is prohibited, care must be exercised in advance to prepare and maintain fire to avoid criticism. Where the fire is light, it must be built up by scattering small quantities of coal over the fire, after which the fire door should be placed against the latch, and if necessary the steam blower lightly applied, giving sufficient time to burn the volatile gases before adding fresh coal to the fire. Before reaching stations, the fire should be built up to avoid dense black smoke, and when closing steam throttle valve, smoke can be prevented by the proper use of blower and the fire door placed against the latch.

29. Superheater locomotives when operated properly will do better work, evaporate less water and use less coal than will saturated steam locomotives under similar conditions. These results are secured by the application of heat to the saturated steam after it is no longer in the presence of the water contained in the boiler, so that its temperature is increased without increasing its pressure. In other words, superheated steam differs from saturated steam, in that it has a temperature exceeding that of the water from which it was generated, while saturated steam has a temperature and pressure corresponding to the water from which it is evaporated. It is this difference in the character of "superheated" steam from that of "saturated" steam that is effective for economy in water and coal.

29-A. The proper use of superheated steam can be depended upon to increase the efficiency of the locomotive about 25 to 30 percent, by reason of the higher temperature and less condensation in cylinders, as well as the reduction of back pressure at moment of steam release, so that the hauling capacity of the engine is increased as a result of a higher mean effective pressure than when using saturated steam.

29-B. In practice it has been found that a boiler carrying 205 pounds steam pressure has a temperature of 390 degrees Fahrenheit, but after the steam has passed through the throttle valve and the superheater units, which are in contact with the hot gases from the fire box passing through the large fire tubes, the temperature of the steam may be increased to as high as 650 degrees Fahrenheit without increasing the boiler pressure or changing the firing or running condition of the locomotive while in service, in which case the steam would be superheated 260 degrees Fahrenheit.

30. The following table shows the temperature of steam at pressures indicated:

	Temp. in Boiler.	
0 boiling	212	degrees F.
50 lbs.	298	" "
100 lbs.	338	" "
150 lbs.	366	" "
160 lbs.	371	" "
170 lbs.	375	" "
180 lbs.	380	" "
190 lbs.	384	" "
200 lbs.	388	" "
205 lbs.	390	" "
250 lbs.	406	" "

30-A. In the process of generating steam, it should be understood that each drop of water coming into contact with heat forms a bubble of steam, and the higher the pressure the more difficult to form the bubble, making more heat necessary to bring the water to the boiling point. It will be noted above, that at atmospheric pressure steam forms at 212 degrees Fahrenheit. At 205 pounds is 390 degrees Fahrenheit. These figures indicate the necessity of maintaining a light, level and bright fire to keep the water at the boiling point and into steam at the pressures usually carried in modern type locomotives.

31. A large factor in the success of maintaining a good fire and fuel economy is up to the engineman in handling of throttle, reverse gear, injectors and sand. No good engineman starts a train by using a full throttle, full cut-off and at the same time start the injectors to work. A boiler too full of water means that the space intended for heating room above the water is reduced or entirely filled with water. Then when the throttle is opened, steam rushing from the boiler in turn reduces the pressure on the water and generally causes considerable quantities of spray and water to be carried along with the steam and washes all lubrication from the surface of valves and cylinders. Water, although a liquid, is as solid and incompressible as iron when confined in a place where it cannot escape. A too high water level in boiler, or leaky throttle or connections, when not properly drained from the cylinders before starting to move engine, is responsible for many cases of broken cylinders and bent rods on locomotives.

a. In the work of boiler feeding, it is a safe and economical practice to avoid extremes. Generally speaking, a scant showing of water in the top gauge cock as a maximum, and from the second gauge cock from the bottom, as a minimum, will be a good margin for safety, except when turning over the top of heavy grades, where it may be necessary to slightly increase the amount of water in the boiler above the minimum. It is also a serious mistake to have too much water in the boiler when starting. With the proper height of water in the boiler, the engine can be expected to start and accelerate speed of train enough to permit to some extent shortening the cut-off before starting the injectors to work. which should be done before losing any considerable amount of water, and same regulated to supply water about as fast as it is used from the boiler.

a-1. When the injector is working, there is a stream of water several hundred degrees colder entering the boiler at the rate of 50 to 100 gallons per minute, and that this colder and heavier water sinks to the lower parts of the boiler shell and fire box water spaces, cooling and shortening of parts in proportion to the reduction of temperature.

a-2. Flue and staybolt leakage is frequently attributed to cold air entering the fire box, but when considering the relative density of air and water, there seems slight probability that cold air will have any weight near the appreciable effect causing leaks, as will the injection of cold water into the interior of a boiler. This is because the greater density of the water gives it the power to absorb heat as fast as the flame can give it to the plates.

b. Before the enginemen leave the engine at terminal, they should fill the boiler to the maximum height. Enginemen and hostlers must be held responsible for making a careful examination of height of water in boiler and condition of crown sheet when first taking charge of or when relieved of engine. When drawing or cleaning fire, the injectors should not be used until a new fire has been rebuilt and in condition to increase steam pressure.

c. When starting engine and train, always have maximum amount of water in the boiler and injectors shut off. When starting on or approaching heavy ascending grades, the height of water in boiler should be near the maximum but not sufficiently high to carry over into dry pipe, valves and cylinders. Ordinarily the water level should be allowed to lose slightly when working hard over controlling grade, or in some cases where steam drops a few pounds (5) injector may be shut off a few seconds when steam pressure will promptly be regained. To work injectors full or too long when not using steam, or where the fire is not in proper condition, permits the cold water to drop to the bottom of boiler down along the sides of fire box and results in severe contraction of the sheets and frequently is the direct cause of excessive leakage at tubes, staybolts and sheets at lower part of the fire box.

32. The general operation of a locomotive using superheated steam is the same as when using saturated steam. It is, however, important to see that cylinder and port cocks are open when standing under steam, and before moving the engine throttle should be slightly opened and the reverse lever moved to full travel, both front and back, until dry steam escapes at the open cylinder cocks. This practice will also serve to gradually remove the water of condensation without damage to valves or cylinder packing and to distri-

bute the oil over the full length of the valve bushing. The slipping of driving wheels when starting a locomotive is liable to cause serious damage and should be avoided.

32-A. Superheater locomotives do not require any greater amount of oil for the lubrication of valves and cylinders, but it is important to emphasize the necessity of keeping the supply of oil constant, because of the high temperature of these parts. For the same reason the throttle valve should always be kept slightly open when drifting or making stops in order to avoid the suction of hot gases from the front end into the steam chest and cylinders. The throttle valve must, however, be closed just before coming to a full stop. Where drifting valves are provided, they should be operated in accordance with the instructions covering same.

32-B. A most important operating fixture of this type of locomotive is the superheater damper, which must at all times be maintained in good condition. When the counter-weight is "up" the damper is open, which permits the flame and gases to pass through the several upper rows of tubes, and when the counter-weight is "down", the damper is closed. Where these engines do not steam, examine and see whether or not the superheater damper works properly, and that when using steam, no steam leaks through the drip pipe attached to the damper cylinder.

32-C. On superheater locomotives, a too high water level lowers the temperature of the steam as it passes through the units and decreases the efficiency which it is possible to secure from the apparatus, so that the advantage to be secured when properly operated is wasted. It may be worth while to recall that where injectors are started at the right time and regulated closely to the amount used, the water will be forced into the boiler at a much higher temperature than when the starting is delayed until necessary to supply water to the full capacity of the injectors. Keep in mind that there is as much chance for the variation of steam pressure from irregular boiler feeding as from poor firing, and further, to encourage trouble with the injectors, allow them to work while taking up water from the track pans, or by working the injectors hard and filling boiler full when running shut off down long grades. These bad habits belong to men known as "hard hitters" or as some may say "he is a hog's head." It is a sure sign of carelessness when the injector is shut off and not put to work until the safety valves blow off steam. That kind of an engineman wastes coal by the pound while the average fireman would waste it by the ounce.

33. Another line of thought worthy of emphasis is for the engineman to always be on good terms with the fireman, who will, if properly encouraged, be more likely to take a personal interest in assisting to maintain a watch over the amount of water carried in the boiler and the operation of lubricator, etc., and not least, in the observation of signals governing the safe operation of the train, as for illustration, in the matter of signals, it may occur during foggy or bad weather, that the engineman may read a signal in the proceed position and the fireman as being in the caution position, in which event the engineman should accept and take prompt action on reading of caution signal until they both again check up by a correct reading of the next approaching signal. It too often happens where the fireman makes the error or they do not agree after passing a signal, that the engineman acts as if he could never make a mistake, and deals out severe criticism to the other fellow. Such action is wrong and should not be permitted. On the other hand, the wise engineman will always disregard his own observation and take action on every caution or stop signal received from any person qualified or authorized to read signals.

33-A. A good engine crew will always keep in mind, in advance of the requirements, what action should be taken in regard to work to be done by the engine. The engineman to so operate the injector as will avoid feeding more water than is being used, and by the proper handling of throttle and reverse lever, avoid unnecessary pulling of the fire, while the fireman should, when firing, keep in mind the amount of work required while that coal is being burned, and always be prepared ahead for the hard starts and pulls and have the fire in such shape as will not require fresh coal immediately before shutting off steam.

34. The frequent extreme variation of steam pressure, as shown on the gauge, is always followed by a variation of

the temperature of water, and also in the metal of the boiler. Maintaining a uniform steam pressure will prevent the damaging effects of expansion and contraction which is generally the cause of leaky tubes, broken staybolts and damaged fire box sheets.

35. Most cases of steam failures reported as being due to poor coal are more correctly speaking brought about by other causes, there being but few places in this territory where the coal mined and supplied to locomotives has a lower heat value than required to insure free steaming of the modern type of locomotive, when maintained in fair condition and properly handled and fired. The Road Foreman of Engines, enginemen and firemen, should know when the firing is done in accordance with correct principles, so that the greatest possible amount of heat will be obtained from even an inferior grade of coal, and in case of steam failure, their investigation should continue to the point where it can definitely be determined whether or not the trouble was due to improper handling or firing, or from the bad condition of the engine, all of which requires some knowledge of the different appliances from the ash pan and grates to the stack, or the trouble may be from bad leaks in valves or cylinder packing, which can waste so much steam that the boiler should not be expected to furnish enough for both the waste and the work. Tubes stopped up or leaking, also steam or air leaks in the front end, may seriously interfere with the draft, and in turn prevent the proper amount of air being supplied to the fire.

36. There are a number of other causes for waste of coal, water and steam pressure, as shown in the following list, all of which can best be determined while the locomotive is in train service, and to this end engine crews should realize their responsibility and learn how to locate and the remedy for any ordinary machine illness.

Improper handling of engine and injectors.
Improper method of firing.
Exhaust nozzle too large or too small.
Netting in front end stopped up.
Stack or exhaust column out of line.

Tubes or fire box seams leaking.
Tubes, stopped up or honeycombed.
Superheater damper and connections defective.
Steam pipes and superheater units leaking.
Piston and valve rod packing, cylinder cocks or throttle valve leaking.
Safety valves leaking or releasing steam below authorized pressure.
Brick arch defective.
Ash pan or grates defective, possibly full of ashes and clinkers.
Valve rigging and valves out of adjustment.

36-A. Where one or more of the defects above noted exist for any length of time, it usually occurs that enginemen and firemen are responsible, at least to the extent of not giving the matter proper investigation and by not making any or of equal importance, an intelligent or proper report showing the actual condition of engine. Where the engineman or fireman is at fault, such cases should not occur frequently, but should be quickly found and corrected by attention from the Road Foreman of Engines.

37. The statement has frequently been made that where trouble occurs by reason of steam failures, the apparent "cure-all" in the minds of many enginemen, is to have the size of the nozzle reduced. This practice is entirely wrong, as it should be well understood that the correct size of nozzle and front end appliances are determined by proper test and experiment for the particular kind of coal and service required. After this has been done, no change in nozzle tips should be permitted until the matter has again received proper investigation.

38. Enginemen must share responsibility equally with the fireman for trouble experienced, due to steam failure, or for the good or bad record of the amount of coal consumed by locomotive, car or ton mile. It is, therefore, of importance for the engineman to know that the fireman applies at least the simplest and best methods of firing and he in turn should be an expert in the many duties involved in the inspection and maintenance of the locomotive, as well as how best to

take advantage of the profile of the track and in the proper manipulation of the reverse lever, throttle and injectors "which means as a general proposition the engine should be worked (except when starting or drifting) with a full throttle when the cut-off is 25% or more of the stroke, but if 25% gives more power or speed than is needed, the reverse lever should remain at 25% cut-off and the thottle partially closed as required." In other words, the engineman should, and necessarily must, know in advance what to do and then act quickly and surely in every routine duty or emergency arising in train service.

38-A. Boiler capacity is the maximum amount of water the boiler is capable of evaporating at a given steam pressure, which in turn determines the amount of work that is done by the locomotive, same being controlled largely by the success attained in providing a proper size opening through the exhaust passages and nozzle tip, together with the arrangement of draft appliances in the front end and the proper amount of air inlets through the ash pan to the fire.

38-B. The hauling power of the locomotive is controlled by the ability of the boiler to supply steam to the cylinders as required, and this power is usually expressed as "tractive effort," which means its hauling capacity in pounds pull on the drawbar, less the amount absorbed by friction, assuming there is provided the necessary adhesion, these results being made possible with locomotives of good design only in combination with correct maintenance, handling and firing conditions, the last two factors being under the control of the engine crew.

39. The heating value of coal can be wasted not only as fuel in the fire box, but also as steam when it escapes at the safety valves or from any point without doing useful work. The capacity of a 4½-inch safety valve is approximately 9,000 pounds of steam per hour, or about 150 pounds per minute, so that should one 4½-inch safety valve be allowed to blow off steam, the loss would be about 150 pounds of steam per minute.

40. A good boiler performance should evaporate 7.7 pounds of water to one pound of coal, so that 150 pounds of steam per minute would represent a loss of 18 pounds of

coal per minute, or one shovelful of coal unnecessarily placed on the fire. It may be interesting to refer to a number of tests made on a certain Locomotive Test Plant, where the engine was operated under the same conditions. In one case the test was fired uniformly and carefully at the rate of 3,000 pounds of coal per hour, or 6,000 pounds total for the two (2) hour test. During this time the boiler pressure averaged 203 pounds steam per square inch, the drawbar pull and speed were uniform, and in the opinion of the firemen just enough coal was used and none wasted. The safety valves blew off 21 pounds of steam in the two hours and the boiler evaporated 7.7 pounds of water to one pound of coal.

40-A. On the next test the coal was fired at a higher rate, or 3,500 pounds per hour, or 7,000 pounds in the two hours, an increase of 16.6%. The surplus steam produced by this heavy firing escaped at the safety valves, which blew off 1794 pounds in two hours, the 500 additional pounds of coal should have evaporated 7 7x500 or 3,850 pounds of water, but actually evaporated 45.7% of this. The steam lost through the safety valves seems, then, to be doubly wasteful, as it had been produced by means of very poor evaporation, and by a large expenditure for coal, for the results obtained.

40-B. The next test under the same conditions, but with the coal restricted to 2,500 pounds per hour, or 500 pounds less than was considered sufficient, resulted in a low average boiler pressure, namely 187.6 pounds, the pressure falling in one hour from 202 to 156 pounds, which shows clearly that the best practical rule to follow in road service is to carry as light, level and bright fire, as conditions will permit, then steam pressure is maintained and the safety valves not allowed to blow excessively when the best results in coal consumption will follow.

41. Another serious waste of coal in locomotive service is brought about from errors in train dispatching and other operating conditions, for which the Transportation Department people should accept responsibility.

On a certain division, it is a matter of record, where a heavy freight train making two trips between the same points, under exactly similar conditions and contributing factors, where one train made two additional and unnecessary stops and starts, which resulted in that engine consuming 17,310 pounds of weighed coal as against 13,425 pounds of coal on the trip making one less stop and start with the train.

It should, therefore, be the duty of someone in each division organization to keep well informed and analyze all cases tending toward bad engine or train performance, and where necessary, recommend or provide a remedy, some of which are as follows:

Engine or crew should not be ordered before it is known trains are ready for departure on order time.

Locomotives should be dispatched with full tonnage trains in accordance with authorized instructions, and tonnage rating should not be reduced unless actually required by weather conditions.

Tonnage rating is a method tested out and adopted on some roads to insure giving an engine in train service the same amount of work regardless of whether the train is made up of all loads or a mixture of loads and empties, as well as to meet the various conditions of weather and track. The maximum tonnage rating is or should be determined after a series of tests over the ruling grades on a division to determine the weight (tons) of train that can be hauled over the grades and curvatures at the speed desired under the best prevailing conditions of weather, etc. The controlling items in train or car resistance are friction of journals on their bearings, the friction of flange and tread or rolling motion of wheels on the rail, friction of center and side bearings, and that due to grade, curvature and wind. In addition to these several factors, which have been well determined and reduced to formula for calculating purposes, there is one particular scheme which involves adding to the total weight of each car a factor which is an estimated figure, also determined by a series of tests, so that the number of cars placed in each train will have approximately the sum total of the actual weight, plus the car factor figure added. By this, or some similar method, it will readily be understood that a train consisting of many empty or light loads, should have a much less actual weight than the heavy loaded cars hauled in short trains, and in both cases the total weight will equal the established adjusted tonnage rating for the several classes of locomotives, with approximately the same wear and tear of machinery and operating expenses, whether or not the trains consist of light or heavy loaded cars.

Great care should be exercised to avoid stopping trains enroute at block stations or junction points for orders, etc., especially where the profile of track makes it difficult to start or accelerate speed of train.

Light movement of engines should be avoided wherever possible. The number of yard engines and crews should be kept at the minimum.

42. Locomotive maintenance and its economical performance in service is largely controlled by the success attained in the lubrication of mechanical parts. It should, however, be understood that where there is insufficient lubrication, or when the lubricants are applied intermittently to journal bearings or valves, the results will be the reverse of economy, either from the viewpoint of maintenance or satisfactory service.

43. For the lubrication of valves and cylinders of locomotives in ordinary service, it has been successfully proven that when using a sight feed lubricator in good condition, entirely satisfactory results can be secured with a consumption of approximately one (1) pound of valve oil to an average of 80 miles on passenger locomotives and the same amount for 50 miles on freight locomotives. To secure these results will mean that the sight feed regulating valves should be adjusted so as not to exceed a maximum feed of six drops per minute for fast and hard service. For hard slow service, a comparatively slower rate of feed will be sufficient. One drop per minute for the steam end of each air compressor will be sufficient. For yard, local and shifting service, the oil limits should be determined on the hourly basis, instead of mileage. When air cylinders are lubricated from the sight feed lubricator, the feed valves should be opened, when starting compressor, to feed five (5) to ten (10) drops of oil, and the feeds then closed until the parts again require lubrication.

44. It should be understood that perfect cylinder lubrication depends not only on the speed at which the lubricator

feeds are working, but also on starting them ten or fifteen minutes before leaving the terminal, in order to thoroughly lubricate all parts before using steam.

45. Feed of lubricators must not be increased when nearing the end of a run for the purpose of draining out the surplus oil, neither should oil be wasted at the drain plug when draining lubricators previous to refilling. All this material should be saved and replaced in the oil reservoir of the lubricator.

46. It is essential, when refilling lubricator with oil, to see that the operating valves are closed and that sufficient time be allowed to make sure that enough condensation is formed to fill the chamber and raise the oil to the top of the oil pipes before the feed valves are again properly opened. Some care in this direction will prevent most of the trouble with lubricators, loss of oil by syphoning and will keep the sight feed glasses clear.

47. It should not be necessary to say that proper cylinder lubrication cannot be obtained when an excessive amount of water is carried in the boiler. Some one has said, with a great deal of truth, that too much water in the boiler is pretty nearly as bad as not enough. In any event, there is no question but that the frequent washing of the valves and cylinders, due to this error, is the most common cause of imperfect lubrication and consequent excessive use of lubricating oil, as well as damage to mechanical parts.

48. The oiling of machinery and journal boxes should be performed carefully, using the best known method for the kind of service and length of run. Sufficient oil should be placed in the oil cups and oil holes, on the guides and wedges, etc., to furnish lubrication for the trip, but no more. Where this cannot be done, the supply should be sufficient to reach some intermediate point, and there replenished for the next stage of the run. At no time should more oil be used on a trip than what will meet the requirements. When oiling around, do not allow the oil to overflow from oil cups, oil holes or guides, as it does no good, and is both wasteful and expensive. When guide or piston rod cups are equipped with adjustable feeds, they should be regulated immediately

before leaving terminal, and closed at the end of each day or trip.

49. It has been noticed frequently that some enginemen, observing these rules, will examine and clean oil holes and oil carefully at the terminal and run over the entire division using very little or no oil on any part of the machinery, while others will oil around several different times under exactly the same service conditions. The use of the former method shows clearly that the engineman knows what is required from the lubricating oils, and what service they can be depended upon to furnish, while the other man's actions as clearly indicating lack of interest in his business. Still other enginemen will apply the same amount of oil for a short trip as for a long run, and must, therefore, be classed with the latter as careless or ignorant of the proper use of oil.

50. Driving box lubrication is obtained by means of a supply of oil from both top and bottom of the journal, while tender and car journals depend altogether on the supply of lubricant from the under side. In either case, however, it is essential that the packing in the journal box cellars be maintained in good condition and in direct contact with the journal, and to this end it is necessary that a good quality of wool waste or other suitable material be provided and same prepared for use by being submerged in oil not less than forty-eight (48) hours, after which it should be drained of free oil in excess of three (3) pounds, per pound of waste, or where oil and new waste is mixed, two pounds of oil per pound of waste, and this material furnished to inspectors well loosened up and not wrapped tightly in balls. When making repairs to journal boxes, or repacking same, the old sponging should be removed, pulled apart and cleaned, in order to remove the dirt and worn out sponging. The good material must be again used in journal boxes. When packing journal boxes it is a great mistake to have the waste contain too much free oil, as this makes it impossible to pack it sufficiently tight under the journal to prevent the waste pounding down away from the under surface of the journal when the locomotive or car is in motion.

51. When giving attention to the waste on top of driv-

ing boxes, care should be exercised to so arrange it that the oil cannot escape too freely through the oil holes to the hub face or of boxes to shoes, and to prevent oil from syphoning over the sides of the boxes. Wick feed through the oil passages to locomotive journal boxes is to be recommended.

52. Dust guards at the back of tender or car journals should be maintained in good condition, and the packing kept firmly set up to the journal at the rear of the box. At the sides the waste should not be allowed to extend above the center line of journal, for if it is allowed to pack against the rising side of the bearing, it will soon become glazed and act as a wiper and is very likely to clean the journal of free oil, preventing it from passing under the bearing.

53. While it is permissible to use valve oil or other heavy greases to lubricate hot driving and other journal boxes fitted for oil feed, this should not be attempted when the bearings are running cool, as they will not flow to the bearing at the lower temperature and instead of helping matters, they will delay the lubrication too long and actually be the cause of excessive heating.

54. Oil cans should be kept in a location on the locomotive that will not allow the oil to become heated above 65 or 70 degrees Fahrenheit as the lubricating properties of the oil are very much impaired when heated to a high temperature.

55. Grease has recently come into general use for the lubrication of main and side rod bearings, and the results obtained have been entirely satisfactory, although the consumption in most cases is largely in excess of the requirements. Grease compound as a lubricant for driving wheel journals has been used exclusively on a large number of locomotives on many different railroads, and where the automatic lubricating device is properly designed and applied, and the proper grade of grease furnished, this arrangement has been found the most satisfactory and economical method of lubricating driving wheel journals on large modern type locomotives.

56. Illuminating oils are furnished to locomotives for use in headlights, torches and lamps. The keeping of head-

lights and torches in good condition is perhaps the most essential requirement for preventing wasteful consumption of this material. The practice of allowing lamps to burn during the hours of daylight, and when not required, is both wasteful and contrary to good railroad practice.

SUMMARY.

Realizing the gravity of the situation as regards fuel supply, and further realizing the possibilities of increasing the supply of concerted action, as well as the immediate possibility of eliminating waste in the use of fuel, the following instructions and suggestions are submitted:

1. Division Officials and employes should be impressed with the weight and importance of the fuel problem. Arrange for Staff meetings for the discussion of this problem on each Division.

2. Study Locomotive Test Plant Bulletins for the important factors relative to level tangents, grades and curve resistance to speed, necessary for determining the proper tonnage rating of freight locomotives.

3. Engines should haul full tonnage trains over the entire division wherever possible. Avoid too much reduction in tonnage during ordinary cold weather. Avoid waste of coal at ash pits and when firing up. See that ash pit delays before fires are cleaned are reduced to the minimum, reorganize the ash pit force to provide continuous fire cleaning service.

4. Assist in working out dispatching schedules for all freight trains and have engines ordered close to schedule time. If trains or engines cannot be made ready, adjust the schedule to save engines standing around under steam, wasting coal..

5. Increase the supervision and direction of the engine crews, and particularly that of new firemen.

6. Give fuel the same supervision that is usually given to the lubricating oil performance. Two or three scoops of coal equal the value of one pint of valve oil.

7. Train dispatchers and train crews should understand the necessity for eliminating unnecessary delays on side tracks and at meeting points.

8. Transportation officials should give particular attention to the use and abuse of the fuel situation. Impress them with the importance of the subject, and that it is equally necessary to follow up fuel matters as overtime or other details of operation, from a dollar-and-cent standpoint.

9. The co-operation of engine crews is essential for the economical use of any class of coal the Railroads may be forced to use, due to excessive demand for high class coal that may be required for special Industrial and Governmental purposes.

10. Road Foremen of Engines, Traveling Enginemen and Firemen must follow the work of engineers and firemen as closely as possible, insisting upon engine crews practicing economy and carryingout instructions.

11. Coal when stored should be so handled as to not be broken up unnecessarily during the process of unloading.

12. Storage coal should be placed on level ground so that it can be picked up free of non-combustible materials.

13. When handling trains on the road, steam must be used with as short cut-off as possible. consistent with the work required, but preferably not less than 25% control. The throttles should be wide open when necessary to do the work at the shortest desired cut-off, otherwise, speed can be regulated by the throttle.

14. With heavy trains, do not delay increasing the cut-off on ascending grades until after losing the desired speed.

15. Do not work engine hard to make unnecessary fast speed.

16. It is the duty of enginemen and firemen to put into daily practice these principles of efficient engine running and firing that will give the most power and best service with the least consumption of coal, and to report all engine or boiler conditions that cause a waste of fuel.

17. Know the road. Take advantage of the profile of track and momentum of train and drift as much as possible. After running for a time with steam throttle valve closed, shut off the injector before again using steam.

18. Learn how to save steam. When that is done, water is saved. When less water is used. coal is saved.

19. Do not allow safety valves to blow off steam. When necessary put second injector to work to prevent.

20. Do not open steam throttle valve while injectors are working. Shut injector off first. This applies to all kinds of service. Real engineers do not do this. Others must not be permitted to do so. Starting and stopping an injector is a simple operation and one easily learned, but to become efficient in boiler feeding requires much thought and study.

21. Coal tipple men must prevent wastage and unnecessary trimming of coal and to keep all coal picked up around their stations.

22. Where a fireman does not employ the best practice, do your part by instructing him, at least have a friendly talk with him, setting him right

23. Locomotives should receive full supply of coal only at points requiring the shortest haul in cars. No unnecessary stops enroute should be made for coal and water.

24. Tenders should be at least nearly empty of coal when sent to shop for repairs.

25. Avoid overloading coal on tenders, thereby avoiding waste on right-of-way and labor picking it up from the track. Where practicable, the collar board around coal space should be moved forward to point at top of slope sheet.

26. Avoid the necessity of too frequent cleaning of fires or too frequent or severe use of shaker grates or scraper while on the road.

27. See to the frequent, but not excessive, wetting of coal on tenders. If properly done, this tends to improve the condition of fire and the cleanliness of engine crew.

28. Close the fire door against the latch for a short time after each scoopful of coal is fired.

29. Fire in a leisurely manner. Three or four scoops at one time to a fire, even with the largest engines, give the most economical results.

30. Do not shake the grates with full throw of lever, except when necessary due to unusual conditions. The best practice is to shake with short quick strokes of the lever.

31. Do not rake the fire except to fill a hole or break up

a bank. When engine is drifting, fire only sufficient amounts to maintain fire in a proper condition.

32. Study the problem of proper firing. Talk about it with other men.

33. Get all the pointers you can from every source, and practice the principles of proper running and firing of engines.

34. Keep foot plate in cab clean and avoid waste of coal by falling to the track, which is also liable to cause injury to employes or passengers at stations.

35. When locomotive fires are cleaned, a competent man should inspect fire box, insuring that grates are fully cleaned, without broken fingers, and when grate lever keepers are in place and locked that grates are level, see that arches are clean, in good repair, and of standard length. See also that flues are clean and free from leaks, giving particular attention to superheater flues.

36. Do not permit locomotives to be held under steam pressure unnecessarily. When necessary to hold engines, bank the fire. If held for more than 24 hours, or other specified time, remove fire.

37. Do not permit fresh coal to be placed in the fire box of locomotives unnecessarily before fires are removed.

38. Do not permit locomotives to leave terminal with fire not in proper condition.

39. Do not permit locomotives to continue in service with mud rings leaking or front end air leaks. Such defects represents a considerable waste of fuel.

40. Make a special inspection of all locomotives to see that exhaust nozzles are opened up to the largest area consistent with the proper steaming of the locomotive.

41. Maintain in good condition brick arches in all locomotives so equipped.

42. Make certain that steam pipes and superheaters are tested at frequent intervals.

43. Cylinder and valve rings should be examined as frequently as the service may require and the valves kept squared up on all locomotives.

44. Do not give, nor accept a signal unless sure to what train or movement it applies.

45. Do not attempt to hang or turn marker lamps without securing a firm hold.

46. Do not neglect to ring the bell before moving engine.

47. Do not move an engine before warning those working about it.

48. Do not get under an engine before knowing it is secured.

49. Do not open blow-off cock, operate air pump, injector, or open cylinder cocks on an engine, without notifying men who may be working about the engine.

50. Do not come in contact with loose or dangling wires. Do not think because the wire is dangling, it is harmless. Loose or dangling wires should be reported promptly.

51. Do not walk on frogs, switches, guard rails, or interlocking machinery and connections.

52. Do not fail to call track signal indications, when required.

53. Do not lean beyond the line of cab or car without exercising care, to avoid being struck at points of limited clearance.

54. Do not stand between the overhang of cab roof of engine and coal chute to pull down chute or to put it up.

55. Do not jump on footboards of approaching engines or cars from a position between rails or from the ends of ties.

56. Do not sit on foot boards of engines while at rest.

57. When newly employed or inexperienced men are members of a crew, the other members should call their attention to possible danger.

58. To avoid personal injury, great care should be exercised while separating steam heat hose between cars or between locomotive and a car, after the train line steam valves have been closed. After the steam hose locks have been released, the hose must not be separated by giving it a quick jerk, but must be released gradually in order that any live steam or condensation which may be in the hose will escape gradually.

59. Enginemen and firemen must see that coal boards, slash bars, scrapers, etc., are not allowed to lie on the aprons of engines and must see that they are so placed on the tenders of engines that they will not fall off nor project beyond the sides where they are liable to cause personal injury, or accidents to trains on adjacent tracks.

60. Shaking of grates and keeping the wings of ash pans clean is a matter that does not receive sufficient attention from engine crews. These parts should be examined and cleaned before leaving engine house tracks and at each stop, in order to insure the proper amount of air passing from the ash pan through the fire.

61. While trains or engines are moving through towns where there are grade crossings, the fireman should keep a sharp lookout to detect and notify the engineman of any signs of danger in order that personal accidents may be averted. A special effort should be made to have the fire in a condition that it will not require attention at such times.

62. Engines being moved on ash pit or inspection pit tracks must not couple to or go against standing engines until after the engineman or hostlers have assured themselves that no one is working on or about them.

63. When taking water, care should be exercised so as not to overflow the cistern.

64. Employes whose duties require them to use torpedoes, must see that they are so taken care of that they are not liable to be exploded prematurely and cause personal injury.

65. Defective parts of locomotives and cars, such as brake rigging, drafts, drawheads, etc., if not loaded on engine or car from which removed, must not be left on the road bed between the tracks, but must be placed at a safe distance from the tracks on either side of the railroad.

66. When a passenger train stops, because of an accident, at a point where an unobstructed view of the opposite tracks cannot be had, engineman must direct the fireman to at once flag the opposite tracks and the flagman will also flag the adjacent tracks, so that approaching trains will not endanger persons who may have alighted from the trains.

67. When starting heavy trains with the slack bunched, steam to cylinders and sand to rails must be used as will prevent jerking trains or slipping of driving wheels. Preferably, sand should be dropped on rail at moment of stop so as to have same under driving wheels when starting or when passing over wet or frosty crossings. Always be ready to start promptly on signal.

68. Rough handling of trains, when equipment is known to be in fair condition, must be considered as inexcusable and unnecessary, and the cause may be divisable under two general headings: first—to bad handling of engine; second—to the improper handling of air brakes.

Such kinks as these, as noted above, are worth while, and when observed will aid in making a good record for the train service. Men who keep these kind of things in mind, in advance of the requirements, soon earn the commendation of all concerned and are frequently referred to as the man with the eagle eye.

VICE-PRESIDENT: Gentlemen you have heard the very interesting address, and seen the very creditable moving pictures and some of you experts undoubtedly have some questions you would like to take up with Mr. Alexander. The subect is now open for general discussion.

MR. A. E. ANDERSON: What proportion of the time are the firemen actually moving coal on the passenger or freight trains from Pittsburgh to Altoona?

MR. ALEXANDER: That would be rather hard to put into figures, first, because it is a continuous performance on some portions of the run, and other portions it is only light work, but we have a 25-mile grade from Johnstown to Gallitzin, and the way some of our engines are handled today it is practically a continuous performance where they are fired properly. For a through passenger train over 114 miles, it is close to a three hour run, and I doubt if they are actually moving coal more than 50% of the time.

MR. ANDERSON: I asked that question for the reason that with the big locomotives they are now running, the question came up as to whether or not you are not actually overworking the human organism.

MR. ALEXANDER: We figure that out in another way, that is, in pounds of coal per hour firing. It is believed the practical limit of coal that a man can fire is about 5,000 or 6,000 pounds an hour over short ruling grades, and where it gets more than that it is a pretty big job.

VICE-PRESIDENT: There is a gentleman here who never passes up an opportunity to express himself and I know you will all be glad to hear from Mr. Stucki.

MR. A STUCKI: It is too bad that our good friend, Mr. Henderson, the late Chief of the Bureau of Smoke Regulation, could not have been with us. I know he would have enjoyed the paper, as every phase of it deals with conservation of coal and prevention of smoke.

The trips between Altoona and Gallitzin shown on the films remind me forcefully of days gone by when we tested the various features of the engines on this long continuous grade.

Mr. Alexander has pointed out that the instruction room is the proper place to instruct the men. I fully agree with him because the only way to get the best results is to understand the apparatus thoroughly, in principle, in construction, and in all the details.

No set of rules, no matter how complete, clear and exacting, can produce the desired results without that thorough understanding.

Then again in cases of emergency, when the right thing has to be done, and quickly at that, superficial training by simply imparting mechanical rules would not suffice.

Besides that, there are unlimited numbers of variations in the details of a locomotive, to which a man has to adapt himself. I have reference to stokers, underfeed and overfeed; air and foot operated fire doors; different constructions of fire boxes; combustion chambers; arches; superheaters; blowers; exhaust nozzles, etc., all of which require special operation, and it is only the man who understands firing thoroughly, in principle and otherwise, who is up to the task.

VICE-PRESIDENT: There are a good many experienced road foremen here tonight who I think ought to express themselves and criticise the paper.

W. H. COLLINS: When I came into the room tonight I met one of my partners in crime and I took him to task regarding condition of one of our locomotives, he said to me for god sake be a booster tonight for once, all you do is knock, I told him then that I would try that once and see if it would do any good and I am glad to say that I cannot criticise tonight due to the fact that the education I have received here and the evening has been spent well, from an educational viewpoint and the pleasure I have received, and due to the fact that the first locomotive I ever handled was a Pennsylvania engine and the first instructions I ever received was from a Pennsylvania engineer, so gentlemen I haven't a word to say tonight in the way of criticism, in fact I am so well pleased that I will do what my friend said when I came in and be a booster for once.

VICE-PRESIDENT: Mr. Collins failed to tell us of some of the things he has been doing himself. After a long fight he got permission to experiment on a nozzle and he finally convinced them that he was right and he is changing nozzles. He might tell us something about that.

W. H. COLLINS: I don't know whether I ought to say anything about that tonight, I came pretty near getting in serious trouble over that nozzle question, but I finally got permission from the Master Mechanic to change one or two of our engines, I knew our nozzles in yard service were too small, those that I changed were from 4⅞-inches to 5½-inches, and from 5 inches to 5⅝-inches, the engineers of those engines are here this evening and when I say we are getting good results from the change I know full well that such is not the truth these men would refute the statement; the reason I don't say much about the nozzle question is I mentioned the fact to one of my superiors that I made this change and he immediately remarked that I had better consult him; to this I remarked, that I was like the old time bridge builder when the boss asked him how he was getting along with the bridge, he said the bridge was alright, trains were going over it but he did not know whether the man had the picture made yet or not, anyway the nozzles are in and we are getting good results from the engines that we have increased the nozzles in and economizing in fuel on these engines to such extent that I have no further trouble when I desire to make a change any more than to notify the Mechanical Department what the result will be or the difference in the size of the nozzle which I have made; making test with the above named two engines namely, 1943 and 1944, in the following condition—engine 1944 5⅝-inch nozzle, 8 brick arch, engine consumed 40 scoops coal per hour, 14 pounds per scoop, 320 scoops coal in 8 hours, 2 shovels of coal to a fire, 2 gauges of water, steam pressure varied 10 pounds, engine popped once, engine previously equipped with 5-inch nozzle used 61 scoops coal per hour, 448 for 8 hours, an approximate saving of 2,000 pounds. Engine 1943 changed from 5-inch to 5½-inch, used 42 scoops coal per hour, 336 for 8 hours, 14 pounds per scoop, 7 scoops to the fire, 2 gauges of water, steam variation 5 pounds, engine used for 8 hours 4704 pounds against 60 scoops per hour or 6720 pounds for 8 hours, approximate saving of about 1800 pounds of coal for 8 hours.

MR. C. A. RICHARDSON: I have listened to the paper with a great deal of interest, and I know that it is desirable that locomotive firing as well as locomotive running should be done from a scientific standpoint. But I also recall that Mr. Alexander, as well as a great many others who undertake to teach scientific methods run up against the proposition of the human element occasionally.

I have sometimes thought that a man ought to become an engineer before he becomes a fireman. If he did that, he would make a pretty good fireman, because of his experience as a locomotive engineer. He would have the benefit of the methods of different firemen. I have been on a locomotive for pretty nearly forty-five years and I have learned a good deal and I believe I could make a pretty good fireman if I tried.

However much effort is made to try to teach a man to do things scientifically, after all it seems to be up to the man to get results. If the fireman would watch these things he could fire a great deal easier. If a man uses his mental faculties as well as his physical it makes the work so much easier.

That reminds me of a little experience I had a number of years ago. The B. & O. tried to use a fuel that we called coke ashes, fine stuff that was left in the bottom of the oven after the coke was removed. They happened to put a tank on an engine that I ran. The engine had only a small pressure of steam and I did not have a regular fireman at that time, and an extra fireman came down to the yard and got on the engine. I thought he would raise a row about it, and I thought he had a right to. I said, "things are pretty bad around here." He says "yes, but we will see what we can do." As soon as he made that remark I knew there was no use in my bothering any longer. When I went to the pit at noon the engine had six or eight inches of that stuff in the firebox. There is an instance of what a man can do.

MR. ALEXANDER: To continue along that line, trying to teach a new man, we have passed through very strenuous times in the last few years. Some of us have no doubt turned over the entire fireman's organization every couple of months. If you analyze that turn-over you will find the larger number of these men who quit do so in the first two or three months, and to my mind the larger number of them quit because they were disgusted. They start out with a fellow who starts in to swear at them instead of trying to help them, and you know how many ways one can take to get even. It takes a lot of time and money to make a railroad man out of new men. We would not turn over so many men if every engineer would take the right kind of personal interest giving instructions to these men, which would also make the work easier for both the enginemen and firemen. Now that times are a little better, it will not be so hard for the Traveling Engineman or Fireman Instructor to give the needed attention to these new men. However, I have a lot of sympathy for the new man that comes to our railroads and starts out on one of our big heavy engines where he does not get the necessary instructions or any sympathy from the men with whom he is working.

VICE-PRESIDENT: There was something said about overworking a fireman. I would like to ask the speaker whether they do not have to relay their firemen on the big engines. Then I would like to ask Mr. Barrett when they got their big hand fired engines if they did not have to relay the firemen there.

MR. ALEXANDER: No, not to the best of my knowledge.

MR. BARRETT: There was no relaying of firemen on the Chicago Division while I was there. That was up in the forty hundreds.

MR. ALEXANDER: On at least two of our Divisions, the Middle and Philadelphia, each 132 miles, they do relay the firemen in this way. That is, they have certain sections of the track over which the brakemen are paid to do the firing. This has always been the practice, not so much on account of the heavy labor involved in firing, but because of the continuous performance over these comparatively level Divisions, where the engine may never shut off steam, so that this relaying is done to give the fireman a chance to rest or eat his lunch.

D. J. REDDING: I want to ask another question. The speaker has had a great deal of experience in training men, firing coal and all that sort of thing. Has he ever figured very closely the relative values of run of mine coal as compared with three-fourths screened coal, that is, the cost per mile for fuel where run of mine coal is used as compared with the same cost where three-fourths coal is used?

MR. ALEXANDER: That is a pretty big contract. The statistical reports with which I am familiar, do not serve to answer a question of that kind. They will give you the amount of coal per ton mile or locomotive mile in passenger service and for freight service, but they include every kind of work, that is, heavy and light tonnage trains. There were figures on the screen where we took the statistical report for freight service for two round trips over the 132 mile Philadelphia Division, and the 132 mile Middle Division, and weighed the coal very accurately and kept a good record of all the factors, and it was surprising how little coal per ton mile it took by their actual performance. These statistical reports are correct in that they must include all kinds of service, but they do not represent the average work of the individual man on the road.

D. J. REDDING: We made some experiments along that line and reached the conclusion that we could well afford to buy three-fourth coal. There is a difference of 15 cents a ton, or there was at the time, between the two different kinds of coal, and we felt that we could afford to buy three-fourth screened coal because we burned so much less of it than we did of run of mine coal that our total cost was lower with this better grade of coal. But that does not seem to be the prevailing practice.

MR. WHITE: (Union Railroad). I would like to ask what Mr. Alexander's instructions are in regard to ash pans, in regard to cleaning fires and banking fires?

MR. ALEXANDER: At the terminal end of runs they try to have the men come in with a bright coked fire, not too big. It is the practice for a turn-around engine, in from two to six hours, which most of them are, to first pull the good fire to the front or back half of the grates and then clean out, say the front section of the grates, after which they push all the good fire over the cleaned grates and clean the other half, and where they go out within a few hours they practically maintain a bright fire over all the grates, but for six and eight hours or more layover, and a brick arch engine, they bank over the rear half of the grates. Where the layover is over 24 hours, they try to draw the fire.

VICE-PRESIDENT: This has been a great day for Pittsburgh, we have learned much concerning the railroad question. At the Chamber of Commerce at noon, the Director-General of Railroads—Mr. Hines—gave a very interesting address covering many phases of the railroad situation. Dominating the talk at the Chamber of Commerce today, as well as the speech last night at the Traffic Club banquet, was the one thought standing out clear and distinct—namely, it was the Director-General's idea that the railroads should eventually pass back into the hands of private owners. Rather optimistic were his observations. While he candidly admitted the depressed times through which we are passing, he felt that they were but temporary and confidently was looking forward to a better movement in railroad affairs within a short time. The audience at the William Penn last night, as well as at the Chamber of Commerce today, was attentive and sympathetic, and displayed a keen interest in the words eminating from one who is in a position to be a master of the subject he had in hand. The same compliment has been paid by you here this evening to Mr. Alexander's paper and I think it is the unanimous opinion that we have had a rare treat.

A technical subject has been interestingly presented by one well qualified to deal into its various ramifications. Apparently trifling matters that ordinarily would escape the casual observer, have been compiled into records and presented as statistics that will make future history. It was a fine tribute paid to the author by Road Foreman of Engines, Mr. Collins, when he from a practical viewpoint stated he did not have any criticism to make. The gentleman from the B. & O. expressed the view of the entire assembly.

I am sure we are all very grateful to Mr. Alexander and his paper will be read with delight, pleasure and instruction, by those who were unfortunately absent this evening, when they receive their copy of the official proceedings.

Is there any further discussion? If not, a motion to adjourn will be entertained.

ON MOTION, Adjourned at 10:37.

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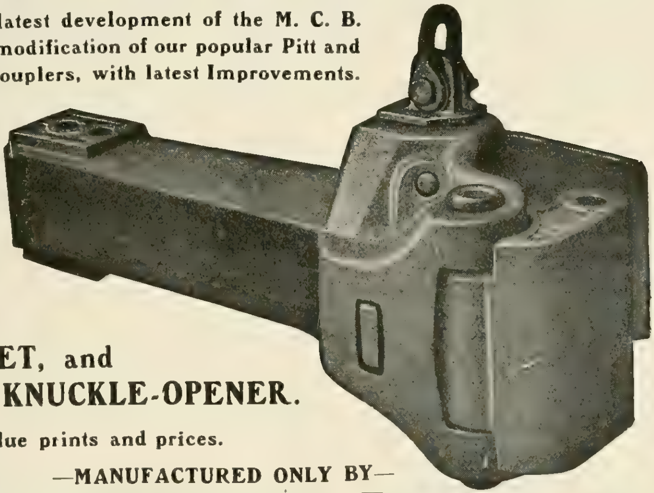

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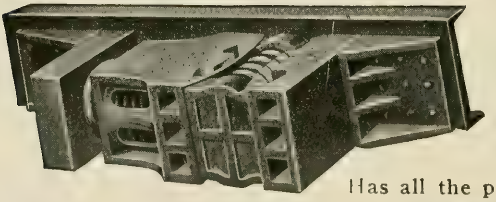

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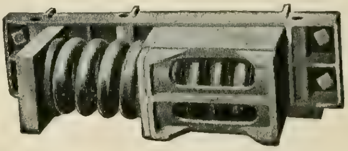

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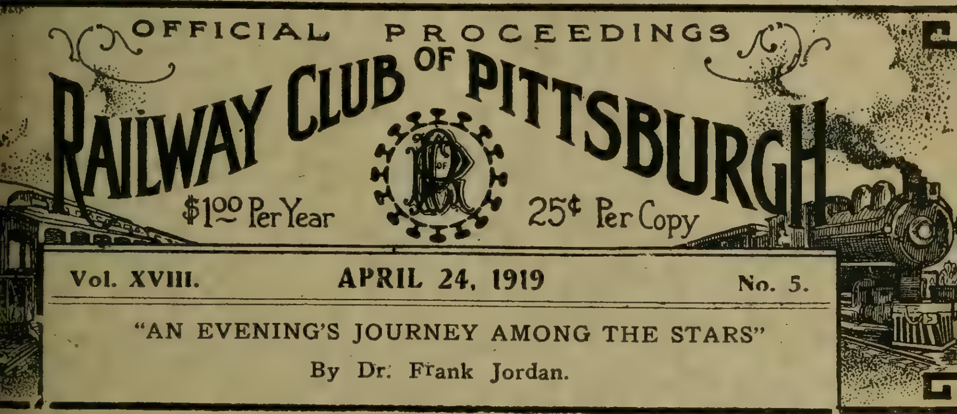

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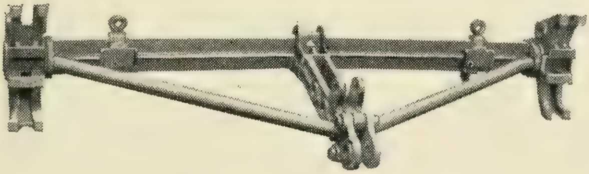

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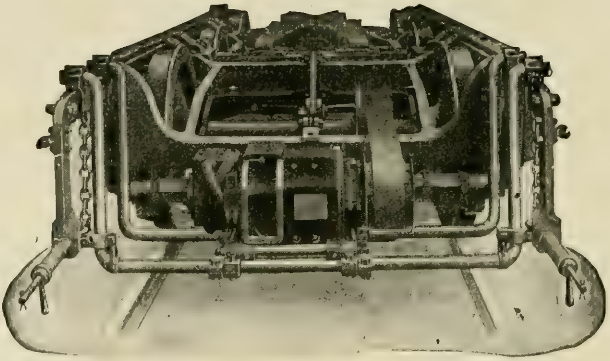

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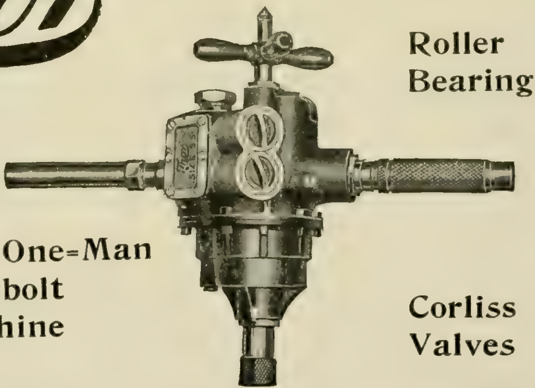

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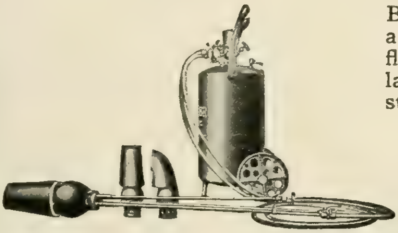

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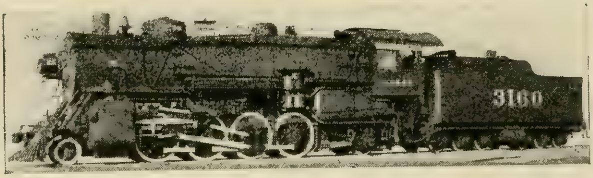

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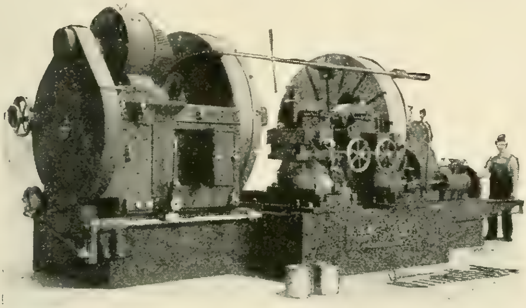

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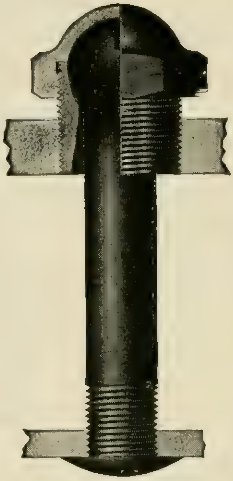

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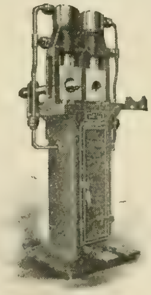

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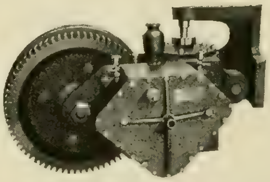

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RAILWAY CLUB NOTES.

The following subjects were presented and discussed by the several Railway Clubs during the month of April, 1919, as noted below:

New York Railroad Club, Harry D. Vought, Secretary,
95 Liberty Street, New York, N. Y.

SUBJECT—"Reduction of Fuel Consumption on the Northern Pacific Railroad" by M. A. Daly, Fuel Supervisor, Northern Pacific Railroad.

New England Railroad Club, Wm. E. Cade, Jr., Secretary,
683 Atlantic Avenue, Boston, Mass.

SUBJECT—Not received.

Richmond Railway Club, F. O. Robinson, Secretary,
Richmond, Va.

SUBJECT—Not received.

St. Louis Railway Club, B. W. Frauenthal, Secretary,
Union Station, St. Louis, Mo.

SUBJECT—"Proper Loading and Handling of Live Stock" by Dr. W. J. Embree.

Southern and Southwestern Railway Club, A. J. Merrill, Secretary,
Box 1205, Atlanta, Ga.

SUBJECT—Not received.

Central Railway Club, Buffalo, N. Y., Harry D. Vought, Secretary,
95 Liberty Street, New York, N. Y.

SUBJECT—Not received.

Canadian Railway Club, James Powell, Secretary,
P. O. Box 7, St. Lambert, near Montreal, Can.

SUBJECT—"Problems in Design and Maintenance of Car Trucks in Relation to Maintenance of Roadway" by W. J. Hyman, Chief Draftsman, Car Department, Grand Trunk Railway.

Pacific Railway Club, Wm. S. Wollner, Secretary,
64 Pine Street, San Francisco, Cal.

SUBJECT—"Transportation of Perishable Products" by H. Giddings, General Agent, Pacific Fruit Express.

Western Railway Club, A. F. Steubing, Secretary,
750 Transportation Building, Chicago, Ill.

SUBJECT—"Electrification of Main Line Railroads" by W. B. Potter, Chief Engineer and S. T. Dodd, Railway and Traction Engineering Department, General Electric Company.

The Railway Club of Pittsburgh, J. D. Conway, Secretary,
515 Grandview Avenue, Pittsburgh, Pa.

SUBJECT—"An Evening's Journey Among the Stars" by Dr. Frank Jordan, Allegheny Observatory.

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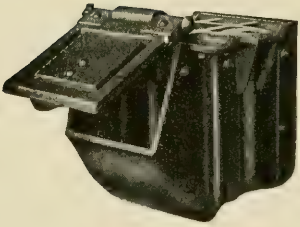

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OF

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Pittsburgh, Pa., April 24, 1919

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Past Presidents

J. H. McCONNELL	October, 1901, to October, 1903.
L. H. TURNER	November, 1903, to October, 1905.
F. H. STARK	November, 1905, to October, 1907.
* H. W. WATTS	November, 1907, to April, 1908.
D. J. REDDING	November, 1908, to October, 1910.
F. R. McFEATTERS	November, 1910, to October, 1912.
A. G. MITCHELL	November, 1912, to October, 1914.
F. M. McNULTY	November, 1914, to October, 1916.
J. G. CODE	November, 1916, to October, 1917.
D. M. HOWE	November, 1917, to November, 1918.

* Deceased.

Meetings held fourth Thursday of each month, except June, July and August.

"RESOLVED, by The Railway Club of Pittsburgh, that any of its members who have now, or who may, during the present World's War, become one of our Country's defenders by joining the Military or Naval Forces of the United States, or who by reason of membership in the American Red Cross, or other Associations in connection with War Activities, are called away from home, shall be exempt from dues and continued as members in good standing until their return home from the War, and that the Secretary shall prepare a Roll of Honor showing such members for the records of the Club."

—ROLL OF HONOR—

ATTERBURY, W. W., Vice-President, Penna. R. R., Broad Street Station, Philadelphia, Pa. (Brigadier-General, Director General of Transportation, American Expeditionary Forces.)

BAKEWELL, DONALD C., Asst. Treas., Duquesne Steel Foundry Co., Pittsburgh, Pa. (Captain, Ordnance Dept., Chicago, Ill.)

BRASHEAR, DR. JOHN A., 1954 Perrysville Avenue, N. S., Pittsburgh, Pa. (National Research Council, U. S. A.)

BROWNSCOMB, G. J., Clerk, Union R. R. Co., East Pittsburgh, Pa. (Canadian Regiment, overseas.)

BUELL, D. C., Director, The Railway Educational Bureau, Omaha, Neb. (Lieutenant Commander, U. S. Navy, Ordnance Department.)

CHRYSTAL, W. A., Bookkeeper, Montour R. R., Pittsburgh, Pa. (Headquarters Company, 319th Infantry, Camp Lee, Petersburg, Va.)

CONNER, WILLIAM P., Efficiency Inspector, P. R. R., Monongahela City, Pa. (Lieutenant, Co. A, 54th Engineers, American Expeditionary Forces, London, England.)

CUNNINGHAM, R. I., Mechanical Expert, W. A. B. Co., Wilkinsburg, Pa. (First Lieutenant, 31st Engineers Reserve Corps, American Expeditionary Forces.)

DEAN, RANDOLPH F., Signal Repairman, P. C. C. & St. Louis Railway, 729 Washington Avenue, Carnegie, Pa. (Battery 4, R. O. T. C., Military Branch, Chattanooga, Tennessee.)

ELLIOT, A. H., Representative, American Brake Shoe & Foundry Co., Philadelphia Pa. (Captain, Engineers Reserve Corps, American Expeditionary Forces.)

FARQUHAR, L. C., Allegheny Steel Co., Pittsburgh, Pa. (First Lieutenant, Ordnance R. C.)

GYLLENFLYCHT, T. E., Draftsman, Pressed Steel Car Co., 1012 Criss Street, Sheridan, Pa. (Captain, 53d Regiment, U. S. Infantry, Chattanooga, Tennessee.)

HEWITT, ELLIS E., Draftsman, W. A. B. Co., Wilmerding, Pa. (Cadet, Air Service, Fort Monroe, Va.)

HOOVER, F. M., President, Hoover & Diggs Co., Pittsburgh, Pa. (Overseas Duty, Y. M. C. A.)

HOTT, G. H., Assistant Yard Master, Monongahela R. R. Co., Brownsville, Pa. (Corporal, Supply Company, 330th Infantry, Camp Sherman, Ohio.)

HOWE, HARRY, Inspector of Castings, Pressed Steel Car Co., McKees Rocks, Pa. (Captain, 107th Field Artillery Supply Company, Camp Hancock, Georgia.)

HUFF, GEORGE F., JR., Assistant Road Foreman Engines, Pennsylvania R. R., Harrisburg, Pa. (Captain, 19th U. S. Engineers (Railway) American Expeditionary Forces.)

KATZIN, WILLIAM, Draftsman, Pressed Steel Car Company, 701 Broadway, McKees Rocks, Pa. (Private, Company E., 319th Infantry, Camp Lee, Va.)

LINDNER, W. C., Foreman Car Repairs, Penna. R. R., 2125 Union Avenue, Altoona, Pa. (Captain, E. O. R. C. 35th Engineers (Railway) Camp Grant, Ill.)

LOCKWOOD, CHAS. H., Draftsman, Pressed Steel Car Co., 366 Lincoln Avenue, Bellevue, Pa. (Second Lieutenant, 7th Battalion, Infantry Replacement Camp, Camp Lee, Va.)

MASON, R. L., Railway Material, Pittsburgh, Pa. (Y. M. C. A. work in France.)

MAXFIELD, H. H., Supt. Motive Power, Penna. R. R., Pennsylvania Station, New York, N. Y (Colonel, 19th U. S. Engineers (Railway) American Expeditionary Forces.)

MORRIS, H. W., Purchasing Agent, Pittsburgh & West Virginia Railway, 115 Belmont Avenue, Crafton, Pa. (First Lieutenant, Ordnance Department, Production Section, Carriage Division.)

MORRIS, J. M., Assistant Master Mechanic, Penna. R. R., Verona, Pa. (First Lieutenant, E. O. R. C., 35th Engineers (Railway) Camp Grant, Ill.)

MURPHY, PAUL F., Civil Engineer, Penna. R. R., Aspinwall, Pa. (First Class Machinist Mate, Naval Reserves, 2nd Naval District, Newport, R. I.)

RAMBO, R. E., Civil Engineer, P. R. R., Pittsburgh, Pa. (223d Squadron, Aviation Camp, Waco, Texas.)

RICHERS, G. J., Assistant Master Mechanic, Penna. R. R., Verona, Pa. (First Lieutenant, Headquarters Detachment, 15th U. S. Engineers, American Expeditionary Forces.)

ROBBINS, F. S., Assistant Master Mechanic, Penna. R. R., 28th Street, Pittsburgh, Pa. (Captain, 19th U. S. Engineers (Railway) American Expeditionary Forces.)

SMITH, CHANDLER P., General Manager, P. L. & W. R. R., Lisbon, Ohio. (First Lieutenant, Company 3, E. O. R. T. C. Engineers.)

STORRS, CHARLES P., Manager, R. R. Dept., Storrs Mica Co., Owego, N. Y. (Lieutenant, U. S. Navy.)

STRAUB, V. V., Salesman, Star Brass Manufacturing Co., 104 E. Dedham Street, Boston, Mass. (Private, Signal Corps, School for Officers, Camp Kelly, Texas.)

WHITMAN, E. B., Assistant Road Foreman of Engines, Penna. R. R., Pittsburgh, Pa. (Captain, 19th U. S. Engineers (Railway) American Expeditionary Forces.)

WILLIAMS, HAROLD S., Stenographer, Pressed Steel Car Co., 99 South Grant Street, Bellevue, Pa. (Private, 35th Engineers (Railway) Camp Grant, Ill.)

WIPPERMAN, F. B., Traveling Engineer, Ohio Injector Co., 1437 Monadnock Block, Chicago, Ill. (First Lieutenant, E. O. R. C., Company B, 311th Engineers, Camp Grant, Ill.)

NOTE—In order to keep the above Roll of Honor correct to date the Secretary will be glad to be advised of any additions or corrections thereto.

PROCEEDINGS OF MEETING,

APRIL 24, 1919.

The meeting was called to order in the Americus Club House, Pittsburgh, Pa., at 8 o'clock, P. M., with President Spielmann in the chair.

The following gentlemen registered:

MEMBERS

Adams, L.
Alexander, J. R.
Allison, John
Amsbary, D. H.
Anderson, A. E.
Arnold, J. G.
Barratt, R. D.
Barrett, F. W.
Beals, R. E.
Beattie, J. A.
Beegle, R. B.
Bell, R. P.
Bennett, R. G.
Berg, K.
Bonifield, C. P.
Brand, H. B.
Branson, C. R.
Brant, W. J.
Calvin, A. W.
Cassiday, C. R.
Charlton, Wm.
Chilcoat, H. E.
Collins, W. H.
Cox, Wm. C.
Christy, F. X.
Conway, J. D.
Courtney, D. C.
Crenner, J. A.
Cromlish, W. L.
Crookston, W. G.
Cunningham, H. R.
Dambach, C. O.
Drebert, E. H.
Durant, C. H.
Elverson, H. W.
Emery, E.
Fendner, W. J.
Forrest, C. H.
Gilg, H. F.
Grieve, R. E.
Gross, C. H.
Harris, J. P.
Haynes, J. E.
Howe, D. M.
Huber, H. G.
Hudson, W. L.
Johnson, A. B.
Johnson, Jno. F.
Jungbluth, Adolph
Kelly, H. B.
Kelley, H. D.
Kinch, L. E.
King, Jr., C. F.
Krepps, T. S.
Laughner, C. L.
Lawson, A. F.
Lloyd, J. A.
Lobez, P. L.
Long, H. P.
Lynn, Samuel
Maisch, Geo. J.
Marshall, W. T.
Matchett, H. K.
Merscher, Jno.
Millar, C. W.
Moyer, Oscar G. A.
McAbee, W. S.
McConn, G. E.
McConnell, P. L.
McDowell, D. W.
McGregor, D. C.
McNulty, F. M.
Nelan, Earl J.
Newell, E. W.

Painter, Joseph
Parker, W. G.
Pehrson, A. K.
Redding, D. J.
Richardson, C. A.
Riley, O. C.
Sattley, E. C.
Shirk, A. R.
Snyder, R.
Spencer, R. L.
Spielmann, J. A.
Stombaugh, J. C.
Strome, H. H.
Stucki, A.
Sutter, Chas.
Thomas, E.
Townsend, J. F.
Tucker, John L.
Turner, F. M.
Ward, W. E.
West, John W.

VISITORS

Allan, W. J.
Brant, Jr., J. G.
Cameron, R. A.
Carruthers, G. R.
Darrah, C. B.
Duff, S. B.
Ferguson, G. M.
George, C. K. W.
Gill, F. H.
Gilson, G. I.
Hammond, J. H.
Hembach, G. S.
Huff, A. B.
Iatros, M.
Jordon, Dr. Frank
Kochlinger, C. W. H.
Leslie, Vernon
Lobaugh, L. G.
Manogue, W. T.
McConnell, Paul A.
McLaughlin, P. J.
Nicholas, A. D.
Reynolds, D. E.
Seaver, E. R.
Thatcher, E. S.
Tumof, J. A. B.

The reading of the minutes was dispensed with, the Proceedings being in print.

The Secretary read the following list of applications for membership:

Allan, W. J., Secretary-Treasurer, Commisary Co. of America, 23 Conestoga Building, Pittsburgh, Pa. Recommended by J. P. Harris.

Brennecke, Charles C., Fireman Inst., P. R. R., 1520 Twenty-first Avenue, Altoona, Pa. Recommended by W. L. Hudson.

Carruthers, George R., Engineer, B. & O. R. R., 221 Mansion Street, Pittsburgh, Pa. Recommended by W. H. Collins.

Crock, George M., Engineer, P. R. R., 425 Third Street, Pitcairn, Pa. Recommended by W. L. Hudson.

Curry, James L., R. F. of E., M. C. R. R. Co., 58 Hazelwood Avenue, Pittsburgh, Pa. Recommended by S. W. Miller.

Dailey, J. L., Engineer, P. R. R., L. B. No. 426, Pitcairn, Pa. Recommended by W. L. Hudson.

Dudley, H. A., Civil Engineer, National Tube Co., 828 Mellon Street, Pittsburgh, Pa. Recommended by J. A. Spielmann.

Gentzel, Harry S., Assistant R. F. of E., P. R. R., 209 Tenth Avenue, Juniata, Pa. Recommended by W. L. Hudson.

Hanna, C. E., Supervisor, B. & O., Millvale, Pa. Recommended by J. A. Spielmann.

Harnish, John A., Engineman, P. R. R., 1018 Fourth Avenue, Altoona, Pa. Recommended by W. L. Hudson.

Hoover, Howard, Special Engineman, P. R. R., Third Avenue and Twelfth Street, Altoona, Pa. Recommended by W. L. Hudson.

Jones, R. J., Treasurer, Penna. General Supply Co., 103 Market Street, Pittsburgh, Pa. Recommended by J. A. Beattie.

Joyce, Stephen F., B. M. Foreman, Monongahela Conn. R. R., 307 Greenfield Avenue, Pittsburgh, Pa. Recommended by S. W. Miller.

McGovern, George J. J., R. H. Foreman, Monongahela Conn. R. R. Co., 501 Culver Street, Pittsburgh, Pa. Recommended by S. W. Miller.

O'Neill, Thomas J., Machinist Foreman, Monongahela Conn. R. R. Co., 1410 Warner Street, N. S., Pittsburgh, Pa. Recommended by S. W. Miller.

Post, W. M., Assistant Superintendent, P. R. R., Cresson, Pa. Recommended by W. L. Hudson.

Ryland, S. C., Locomotive Engineer, B. & O. R. R., 5235 Gertrude Street, Pittsburgh, Pa. Recommended by W. H. Collins.

Shade, Howard Milton, Air Brake Instructor, Penna. R. R., 114 Locust Street, Conemaugh, Pa. Recommended by R. E. Grieve.

Seibert, Daniel D., Instructor of Fireman, Penna. R. R. Co., 174 Fourth Street, Conemaugh, Pa. Recommended by W. L. Hudson.

Spangler, Chas. P., Pattern Maker, Monongahela Conn. R. R. Co., 53 Almeda Street, Pittsburgh, Pa. Recommended by S. W. Miller.

Strople, G. H., Superintendent, B. & O. R. R., Callery, Pa. Recommended by J. A. Spielmann.

White, William T., Engineer, Penna. R. R., 565 Third Street, Pitcairn, Pa. Recommended by W. L. Hudson.

Williams, A. P., Division Engineer, B. & O. R. R., Connellsville, Pa. Recommended by J. A. Spielmann.

Wilson, Henry J., Salesman, A. O. Norton Jack Co., 440 Brookline Avenue, Boston, Mass. Recommended by F. M. McNulty.

PRESIDENT: Upon approval by the Executive Committee these gentlemen will become members without further action than the payment of one year's dues.

Is there any further business to come before the meeting? If not we will proceed to the paper of the evening. We were to have had a talk by Mr. Tabor. I am very sorry to say that he has disappointed us. The Secretary wrote him two letters and received no answer, and you can draw your own conclusions. I can not tell you why he is not here. He promised faithfully to be here, and I know you would all enjoy his talk.

We are fortunate in having with us tonight Dr. Frank Jordan who represents Uncle John Brashear and will take his place, as Uncle John is unfortunately indisposed and can not be here. Dr. Jordan's address will be a rare treat. His subject is "An Evening's Journey Among the Stars," and it will be illustrated by a number of fine slides. It gives me great pleasure to present to you Dr. Jordan.

DR. FRANK JORDAN: Five hundred years ago astronomers had no way to aid the human eye in observations of the sky. But even with the naked eye they had found out a great deal about the stars and their motions. If at that time some one should have predicted that the power of the eye could be multiplied two or three hundred times, he would have been put in the mad house. But in 1609 Galileo, having heard that some one had invented an instrument for bringing objects nearer, devised one for himself, a small telescope that magnified three times. Later he made one that magnified ten times as much as that, and with that small telescope he upset a great many ideas that people had held up to that time. He looked at the surface of the sun, which before that was considered absolutely spotless, and upon it he saw spots. He looked at the moon, which was considered as a smooth body, and discovered upon it mountains, valleys, plains and craters. He looked at Jupiter and found revolving about the planet, four moons that had never been seen before. He thus overthrew the idea that in the solar system there could be only seven planets, since seven was considered a sacred number, and to add to that number of planets was heresy.

Now from the telescope of Galileos time to the great telescopes of the present day is a far cry. But the development from those to the great ones of today has been a gradual one as has been everything else in the history of the human race. The glass makers of those days had great difficulty in making suitable pieces of glass, and the opticians in grinding those into proper shapes for lenses. So the telescope developed slowly. The object lenses of the first telescopes were single as contrasted with the acromatic lenses we now have in practically all optical instruments. With an ordinary single lens, a bright object is surrounded by a ring of color, which produces indistinct images. Spherical aberration in such lenses is also very troublesome. To partially correct for these defects the old telescopes had to be made of very great length in order to get anything like suitable definition. Some of them were made as long as two hundred feet, and were correspondingly unwieldy. We can only wonder how the astronomers of those days with such crude instruments did as much good work as they did.

From the fact that telescopes of that kind were difficult to construct, astronomers swung over to the so-called reflecting telescopes. From the time when the reflecting telescopes were first made with a concave mirror five or six inches in diameter and a focal length of five or six feet, up to the present time when one is being constructed with a diameter of 100-inches and a focal length of something like 50 feet, the growth has been gradual. The great observer of the Eighteenth Century, Sir William Herschell, was the man who in those days developed the reflecting telescope to its greatest extent. He finally constructed one with a mirror four feet in diameter and a focal length of forty feet. Later Lord Rosse constructed one six feet in diameter with a focal length of possibly sixty feet.

About the middle of the Eighteenth Century Dolland, an English optician, invented the achromatic lens, composed of two lenses of different kinds of glass by which the color effect was counteracted. With two lenses the curves could be so determined that corrections for aberration could also be made and thus much more distinct images resulted. From that time the refracting telescope was developed until it culminated in the 40-inch telescope of the Yerkes Observatory in Southern Wisconsin.

At the present time the tendency is back toward the reflector and there is now in use at Victoria on Vancouver Island a reflecting telescope 72 inches in diameter. The mirror for that telescope was constructed by the firm in this city of which Uncle John Brashear is the head. The same firm has constructed other large mirrors and large refracting telescopes, one of which, with a lens 30 inches in diameter is in use at the Allegheny Observatory. Taking up an entirely different subject, we usually think of the earth as a large body. And in one way it is, although as compared with the other heavenly bodies it is quite small. To give us an idea of the size of the earth, suppose it were melted up and cast into balls ten miles in diameter; it would make 500,000,000 of those. We illustrate things now in terms of war. Suppose the substance of the earth were cast into shells each weighing one ton. If we had a sufficient number of guns to fire a million of those shells per second and keep it up continuously day and night, the earth would be entirely shot away only after the lapse of 200,000,000 years.

That will give you some idea how large our earth really is. The mere statement that it is 8,000 miles in diameter does not give us any real idea of its vast size. But compared with the other bodies in the universe the earth is very small. For example, our sun is 1,300,000 times the bulk of our earth. And there are a vast number of stars out in space, many invisible to the naked eye, that are very much larger than our sun. In fact some astronomers have estimated that some of those stars are 1,000,000 times the bulk of our sun.

Suppose we consider distances for a moment. I believe you are all in some way connected with railroads and familiar with the speed of railroad trains. To travel to our nearest neighbor in space, the moon, on a train at the rate of sixty miles per hour, would require a journey of 167 days. To travel from here to the sun under the same conditions would take 177 years. Most of you have passes and could travel for nothing; but the unfortunate who has not, would have to pay $2,800,000 for a single ticket. He would have to sleep and eat, and his Pullman and meals would cost him $400,000 extra. To keep the porter in good humor he would have to have loose change in his pocket to the extent of about $33,000 to make the trip.

A modern rifle toll would require 5½ days to reach the moon and 6½ years for that shot to reach the sun. To reach even the nearest fixed star at the same rate would require 1,500,000 years.

Another illustration of the distance of the nearest star may be given in this way. The spider web which you engineers use in the eye pieces of your transits is so fine that it is estimated that a pound of it would reach 25,000 miles, enough to encircle the earth, but to span the distance to the nearest fixed star would require 500,000 tons of it, which will give you a little idea of the vast distance of the very nearest fixed star. And there is only one star visible to us that is within that distance. Within twice that distance there are about eight others. Within three times that distance we have something like 27 stars. The vast majority however are immensely farther away than the nearest.

In speaking about the distance of the stars, miles is a unit that is entirely too small, so we have taken another unit which we call the light-year. Light travels at the rate of 186,000 miles per second, about 7½ times around the earth every second. We use as a unit of distance in space the light-year, or the distance light travels in the course of a year, and that is about six trillions of miles. The nearest fixed star is a little over four of these light years away from us. We call that our near neighbor Eight others are within eight or nine light years The very faintest ones that can be seen or photographed are at least 10,000 light years away from us. Evidence that is accumulating at the present time goes to show that some of the star clusters and nebulae of which we will see illustrations on the screen are possibly as much as 200,000 or even 500,000 light years away from us. Figures of that kind are absolutely incomprehensible to us, but they give a little idea of the vast extent of the universe; and we have certainly not penetrated to anything like the extent of the universe as yet.

Now when the nebulae were discovered in the sky, and we found large numbers of them, the idea used to be that those nebulae were other systems of stars and worlds entirely outside of our own system. But as observations went on astronomers believed that they were within our own system. But in the last ten or fifteen years we are coming to think from certain evidence that these are actually systems or galaxies outside of our own, and it is only because of their immense distance that they look small to us.

We have again taken up what was the ancient conception of them, and are now coming to accept the theory of systems of systems. We start with our own system, the earth and the moon together, a system of the first order. The moon revolves around the earth. Then the moon with the earth and other planets revolving around the sun form a system of the second order. Our sun with all its planets revolving around some other center is a system of the third order. And now the idea is coming to be that we have a number of these systems revolving around some other center, making systems of the fourth order; and there is no reason for not going beyond that. Whether that is correct we do not know, but we simply offer it as a suggestion around which we try to build up certain theories, and about which we can think.

We frequently have people come to the Observatory, who after looking through the telescope at something will say how beautiful it must be to look at the wonderful things in the heavens. Their idea of an astronomer's work is about like this: When the fancy seizes him he sits down at the eye end of the telescope, looks about over the sky more or less at random, seeing whatever things he can see, and trying to make some new discovery. There can be nothing very much farther from the truth than that. The astronomer does not go to the telescope when he pleases but when his time comes; he does not sit there a little while, but stays all night, and under all sorts of conditions. He seldom looks at anything through the telescope, because practically all the work of astronomy is done at the present day by means of photography. That means that the large telescope we have at the Allegheny Observatory is never used for looking at all, but exclusive for photography. It is simply a huge camera. And the astronomer's work is practically all photographic work. The big dome in which the telescope is located is not heated and the astronomer works under all kinds of temperature conditions, winter just as well as summer. On a winter night when the thermometer is at zero the astronomer simply sits at the telescope practically without any exercise and with such a temperature I think you will realize that the work of the observer is not at all romantic. If any of you do not get that, just come up some winter night, sit down with the observer and go through a night of that kind. You will find him dressed like an Eskimo trying to get a little warmth, and that will give you an idea that the actual observing work of the astronomer is nothing to go into raptures over, and is nothing in which we can find very much romance. Of course the interest to the astronomer comes when he takes the plates which have been developed, studies them and measures them, and in so doing gets his results from them. He is not especially interested in work with the telescope.

(A number of slides were shown and explained.)

On the day of the total solar eclipse there appeared in the heavens a new star. Possibly some of you saw it. One astronomer at least, one of the most famous in this country, was very much disappointed because the sky was partially cloudy, while he was making his observation of the eclipse of the sun. Going out in the evening and looking around he saw down in the southeastern sky a star that had not been there before. By the next night, June 9th, that star became the second brightest new star that had appeared since 1604, more than 300 years. So that astronomer felt somewhat compensated for what he had lost by the clouding of the sky during the solar eclipse. These new stars appear rather frequently, every few years, most of them not bright enough to be seen by the naked eye. What causes them is as yet an absolute mystery. They are not new stars, since they have existed in that position before, but for some reason the light of those stars has been immensely increased within a very short time. This new star that was seen first on June 8th increased in brilliancy at least 100,000 times within two or three days. How a star could do that is as yet an unsolved problem. It used to be the theory that this was the result of a collision of two comparatively dark stars moving along in space. That theory has been practically abandoned. All we know is that these stars appear occasionally. They are very peculiar. They increase very suddenly, and then diminish in their light more slowly, but still comparatively rapidly. Although that star on June 9th was the second brightest star in the sky, yet at the present time it is invisible to the naked eye, and will probably continue to decrease in brightness until it gets down to the same luminosity it had before its great outburst came.

PRESIDENT: Are there any questions any of you would like to ask? I am sure Dr. Jordan will be glad to answer them.

MR. A. E. ANDERSON: We have been raised on the nebular hypothesis. What are you experts going to provide in place of it?

DR. JORDAN: We haven't anything. There are many difficulties about the nebular hypothesis which break down under mathematical analysis. It is a beautiful theory, and possibly in some modified form really represents what has taken place in the formation of our system. But with the original form of the nebular hypothesis there are many difficulties which prevent its acceptance. There are physicists at the University of Chicago who have replaced that by what they call the planetesimal theory; two bodies have come close together; mutual attraction has broken them up and strung them out in space forming a spiral nebulae, one of the bodies forming one of the arms of the nebulate, and the other stringing out to form the other. You noticed that the nebulae all seem to have two arms radiating from the same center. The theory is that these small particles of the arms will gradually come together and form planets while the central mass will form a sun. There are also very great difficulties in a theory of that kind. We virtually know absolutely nothing about the formation of solar systems.

MR. D. M. HOWE: In your remarks you made a comparison of the atmosphere in this country with that of tropical countries. In my younger days I was very fond of travel and I have traveled a great deal in tropical countries. And I have noticed a certain season in the year, from about the first of February to the first of April, when the trade winds are blowing—they always come east—the sky is very very clear. At night on the deck of a steamer in the southern seas you would see many more stars than you would see here on account of the clear atmosphere. Why is the atmosphere so much clearer there?

DR. JORDAN: On our western plains the stars are very brilliant. I do not know whether the tropical air makes the stars more brilliant than in our western plains, because I have never been in the tropics.

MR. HOWE: Yes, it is much clearer down there.

DR. JORDAN: I don't know why that should be. I have experience only in the west.

MEMBER: Do you make use of color photography?

DR. JORDAN. In a way. In many of the photographs on the screen you saw white points. Those are star images. The greater the size of these the brighter the star. We photograph them on an ordinary plate, measure the diameter of the image, and by a certain formula find out how much brighter one of these stars is than another. But a great many of these stars are colored. We photograph the stars through color screens on isochromatic plates and get a different effect than on ordinary plates. That is the only way we use color photography. We do not get colored images at all, but we study colored stars by means of this special device.

MEMBER: Does the color help you in spectroscopic work.

DR. JORDAN: When we pass a ray of white light through the prism of the spectroscope the prism draws that ray out in a band, showing the prismatic colors. This band of light is crossed by dark lines which are caused by substances in the star itself. In the laboratories we can produce a spectrum crossed by lines belonging to a known element, and we find the same lines in the spectrum of the star. Hence we can tell the substances of which that star is composed. We find in them the same substances we have on the earth.

MEMBER: Does that hold with Mars?

DR. JORDAN: No, because Mars does not give any light of its own, but only reflected light from the sun. But when we come to the stars that give their own light, we find that a white star gives a certain spectrum, showing that it is composed of certain substances; a yellow star is composed of perhaps those substances with the addition of several others; a very red star has a spectrum quite different. Stars have been classified with respect to their spectrum. Just recently there has been published a work by the Harvard College Observatory which will give the spectrum and classification of 225,000 of the brightest stars in the sky, and we know exactly the substances composing them.

You all learned this little verse when you were children:

Twinkle, twinkle, little star,
  How I wonder what you are,
Up above the world so high
  Like a diamond in the sky.

The modern version is this:

Twinkle, twinkle, little star,
  Now I know just what you are,
When I see you in the sky,
  I the spectroscope apply.

MEMBER: Did you ever find an element which you could not identify?

DR. JORDAN: Yes, there have been elements that we could not identify. There are substances in some of the stars that give lines which we have not yet been able to reproduce in the laboratory. That does not necessarily mean that they belong to substances we do not have here, but under the conditions that exist in those stars, for instance temperatures that we can not reproduce in our laboratories, there may be a change in the spectrum. Some of those stars are supposed to have a temperature of 10,000° Fahrenheit. 10,000° might break them up into different lines from what we have at 5,000°. And even though we can not identify those lines it does not necessarily mean that there are substances there that we do not have on the earth. If we ever have means of getting such high temperatures in the laborators we may get those results.

MEMBER: What is the difference in time between Pittsburgh standard time and actual time?

DR. JORDAN: 20 minutes 5.39 seconds, that is the difference at the transit instrument of the Allegheny Observatory. In other parts of the city it is greater or less. One mile east or west makes a difference of four seconds. But when people speak of the difference between standard time and local time we say 20 minutes 5.39 seconds. That does not consider the added summer hour.

MR. A. E. ANDERSON: Is the reflection you spoke of from the planet a reflection from the body of the planet or from the atmosphere?

DR. JORDAN: In Mars it is probably from the body of the planet. In Jupiter it is probably reflected from the atmosphere of the planet. From Venus we do not know. I saw within a day or so where some one had taken a spectogram of Venus, and he claimed that it was not from the clouds but from the body of the planet.

MR. H. F. GILG: Will you explain the bolometer?

DR. JORDAN: Professor Langley's bolometer is a very sensitive thermometer. It is used in measuring the heat of the sun in the various parts of its spectrum. The spectrum of the sun is allowed to fall on a very thin platinum wire through which a current of electricity is passed, and the heat energy changes the rate of flow of the electricity through the platinum wire. The spectrum is allowed to drift lengthwise across the wire. When a line in the spectrum falls upon the wire the less heat there is registered by the galvanometer. By means of the lesser heat registered in certain parts of the spectrum, lines were located in regions far beyond where the energy could affect the eye. We know that a great deal of the heat we get from the sun does not affect the eye at all. The most intense part of the so-called heat spectrum of the sun is beyond the red that we can see with the eye, and this bolometer extends the spectrum far out beyond the red in the spectrum of the sun.

MEMBER: What planet has been the subject of the most study?

DR. JORDAN: Probably Mars.

MEMBER: Why is that?

DR. JORDAN: You saw on the screen the disc of that planet with the canals on it. As soon as those were discovered, that turned the attention of astronomers to that subject and they mapped more and more of those canals. One astronomer in America, Lowell, took up the study of Mars as the work of his observatory and made it practically his life work. It gets nearer to us than any of the other planets except Venus and is more easily observed than the latter.

PRESIDENT: Are there any further questions? This evening has been an opportunity that few of us ever had before or ever will have again. We have got much more information in this short time than we could ever get out of any book and we have got it first hand. I do not know how we can adequately express our appreciation of the Professor's talk.

MR. ANDERSON: I would move that a rising vote of thanks be tendered to the speaker of the evening for his painstaking and illuminating talk.

The motion prevailed by unanimous vote.

ON MOTION, Adjourned at 10 o'clock, P. M.

J. D. CONWAY, Secretary.

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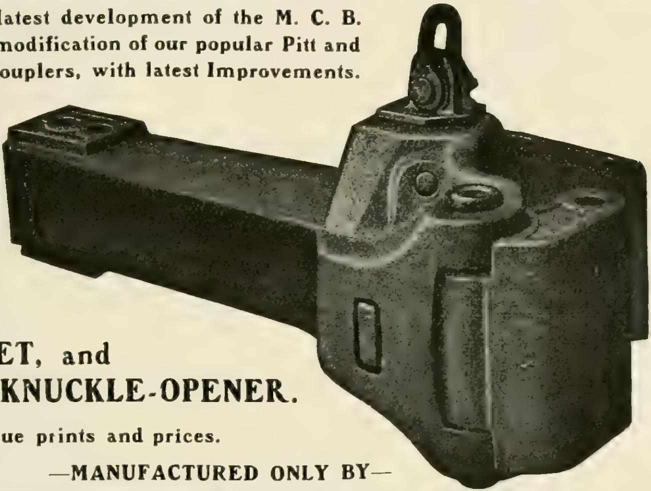

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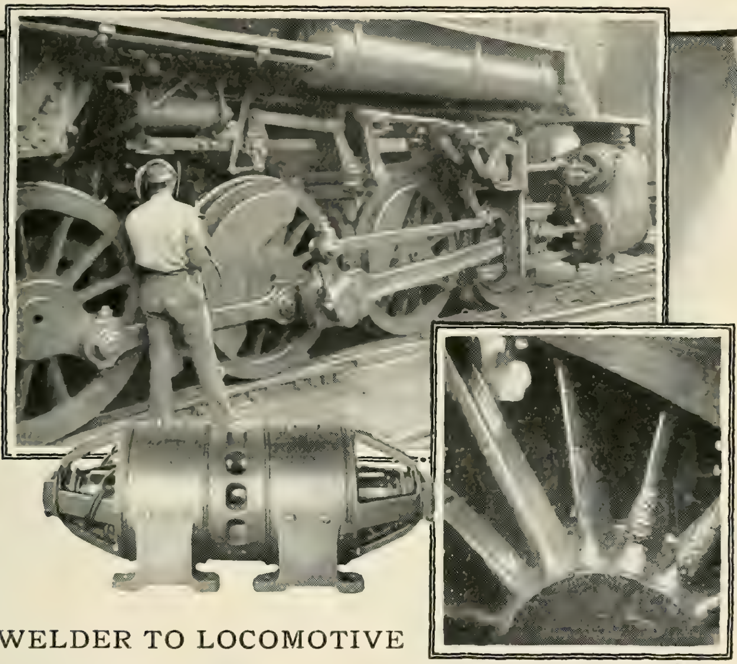

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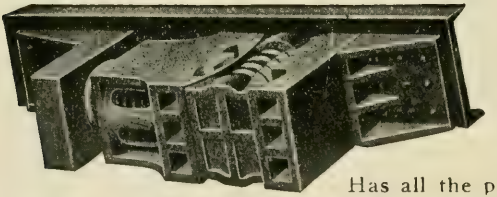

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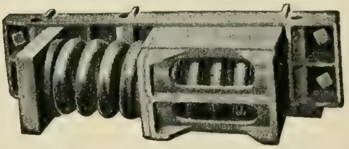

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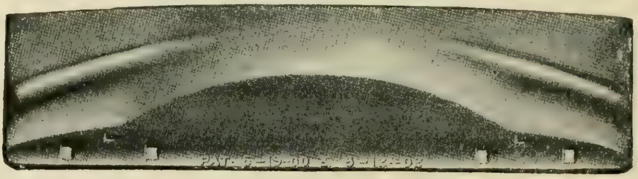

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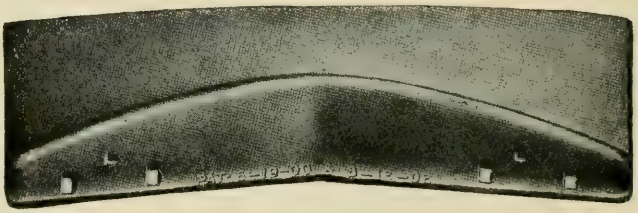

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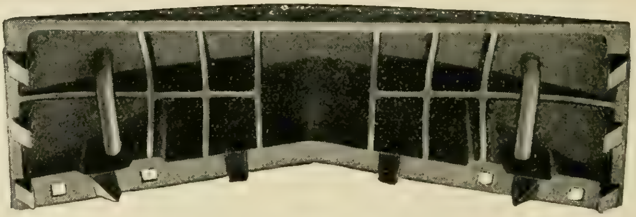

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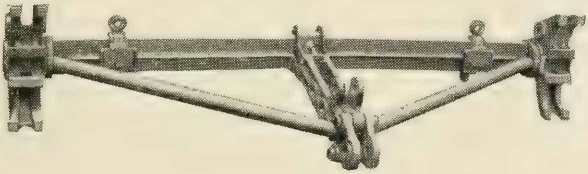

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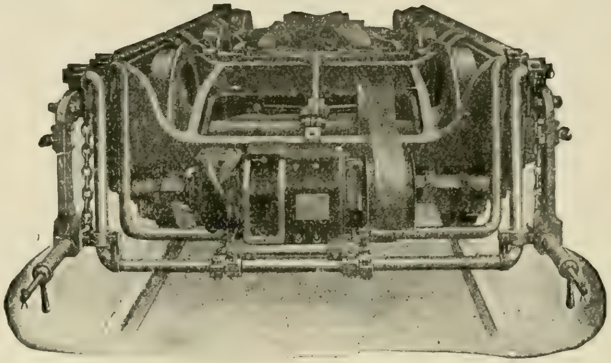

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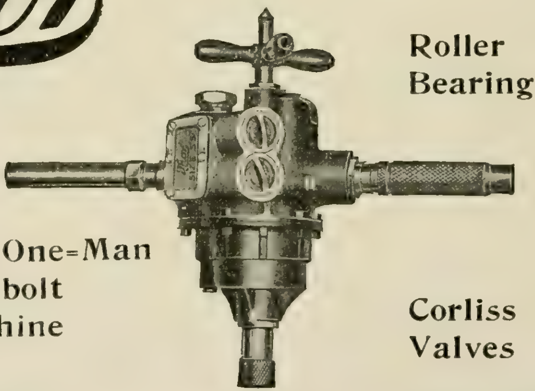

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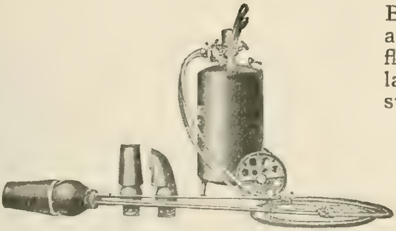

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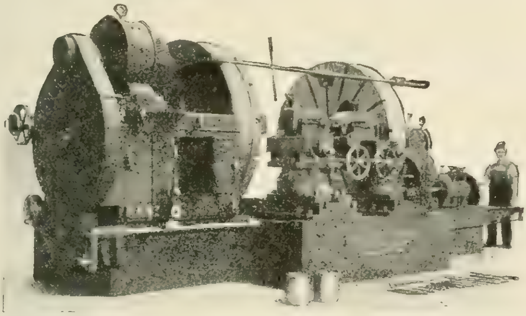

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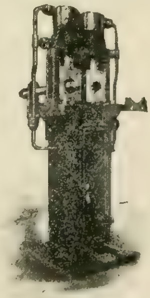

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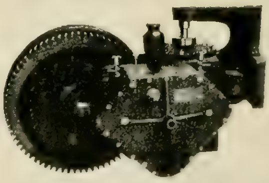

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RAILWAY CLUB NOTES.

The following subjects were presented and discussed by the several Railway Clubs, during the month of May, 1919, as noted below:

New York Railroad Club, Harry D. Vought, Secretary,
95 Liberty Street, New York, N. Y.

SUBJECT—"Railroads of Foreign Countries" by Various Authors.

New England Railroad Club, Wm. E. Cade, Jr., Secretary,
683 Atlantic Avenue, Boston, Mass.

SUBJECT—Not received.

Richmond Railway Club, F. O. Robinson, Secretary,
Richmond, Va.

SUBJECT—Not received.

St. Louis Railway Club, B. W. Frauenthal, Secretary,
Union Station, St. Louis, Mo.

SUBJECT—"The Operation of Federalized Railways under War Conditions" by Carl R. Gray, U. S. Railroad Administration.

Southern and Southwestern Railway Club, A. J. Merrill, Secretary,
Box 1205, Atlanta, Ga.

SUBJECT—"Tonnage Rating" by J. Lowell White, Superintendent of Transportation, A. C. L. Railroad.

Central Railway Club, Buffalo, N. Y., Harry D. Vought, Secretary,
95 Liberty Street, New York, N. Y.

SUBJECT—"Modern Railroad Power Plants" by William Olsen, Supervisor Steam Plants, M. P. Department, N. Y. C. Railroad.

Canadian Railway Club, W. A. Booth, Secretary,
131 Charron Street, Montreal, Canada.

SUBJECT—Annual Meeting.

Pacific Railway Club, Wm. S. Wollner, Secretary,
64 Pine Street, San Francisco, Cal.

SUBJECT—"Cause and Prevention of Freight Claims" by Several Authors.

Western Railway Club, A. F. Steubing, Secretary,
750 Transportation Building, Chicago, Ill.

SUBJECT—Not received.

The Railway Club of Pittsburgh, J. D. Conway, Secretary,
515 Grandview Avenue, Pittsburgh, Pa.

SUBJECT—"Recruiting a Regiment of Locomotive Repair Men" by Colonel James Milliken.

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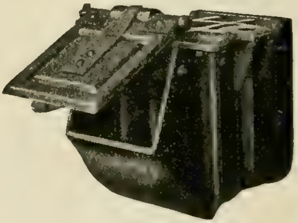

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OF

The Railway Club of Pittsburgh

Organized October 18, 1901.

Published monthly, except June, July and August, by The Railway Club of Pittsburgh, J. D. Conway, Secretary. 515 Grandview Ave., Pittsburgh, Pa.

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Vol. XVIII.
No. 6

Pittsburgh, Pa., May 22, 1919

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Past Presidents

J. H. McCONNELL	October, 1901, to October, 1903.
L. H. TURNER	November, 1903, to October, 1905.
F. H. STARK	November, 1905, to October, 1907.
* H. W. WATTS	November, 1907, to April, 1908.
D. J. REDDING	November, 1908, to October, 1910.
F. R. McFEATTERS	November, 1910, to October, 1912.
A. G. MITCHELL	November, 1912, to October, 1914.
F. M. McNULTY	November, 1914, to October, 1916.
J. G. CODE	November, 1916, to October, 1917
D. M. HOWE	November, 1917, to November, 1918.

* Deceased.

Meetings held fourth Thursday of each month, except June, July and August.

PROCEEDINGS OF MEETING
MAY 22, 1919.

The meeting was called to order in the Americus Club House, Pittsburgh, Pa., at 8 o'clock, P. M. with President Spielmann in the chair.

The following gentlemen registered:

MEMBERS.

Adams, L.
Alian, W. J.
Allison, John
Arnold, J. G.
Babcock, F. H.
Barratt, R. D.
Bell, R. P.
Bennett, R. G.
Berg, K.
Bonifield, C. P.
Bradley, W. C.
Brand, H. B.
Branson, C. R.
Brant, W. J.
Bridges, S. G.
Burtoft, J. N.
Calvin, A. W.
Cassiday, C. R.
Charlton, W.
Christy, F. X.
Cline, W. A.
Collins, W. H.
Conway, J. D.
Courtney, D. C.
Cremlish, W. L.
Crockston, W. G.
Cunningham, J. L.
Dambach, C. O.
Drayer, U. S.
Durant, C. H.
Durkin, Jas. E.
Elverson, H. W.
Emery, E.
Fendner, W. J.
Forrest, C. H.
Gearhart, J. A.
Gies, George E.
Gleason, D. T.
Gross, C. H.
Guay, John W.
Haines, W. L. R.
Harris, J. P.
Haynes, J. E.
Hepburn, M. J.
Hettler, R. C.
Higgins, H. L.
Hoffman, C. T.
Huber, H. G.
Hueston, Wm. F.
Johnson, A. B.
Johnson, Jno. F.
Jungbluth, A.
Kelley, H. D.
Kelly, H. B.
Kinch, L. E.
King, Jr., C. F.
Klingelhofer, C. T.
Kummer, Jos. H.
Lanahan, J. S.
Laurent, Geo. F.
Lehr, Harry W.
Lindstrom, C. A.
Lloyd, J. A.
Lobez, P. L.
Long, Edw.
Long, H. P.
Maisch, Geo. J.
Marshall, W. T.
Matchett, H. K.
Mitchell, A. T.
Moyer, Oscar G. A.
McAbee, W. S.
McConnell, P. L.
McDowell, D. W.
McGregor, S. S.
McNulty, F. M.

Nelson, W. O.
O'Conner, M.
Painter, Jos.
Parker, W. G.
Purdy, W. F.
Rabold, W. E.
Redding, D. J.
Robeck, George
Rose, A. J.
Sandman, A. G.
Schaaf, A. J.
Schaefer, Frederic
Schaich, Wm. L.
Severn, A. B.
Shirk, A. R.
Smith, F. C.
Snyder, J. W.
Spence, L. E.
Spencer, R. L.
Spielmann, J. A.
Sponsler, W. L.
Stark, F. H.
Strome, H. H.
Stucki, A.
Swift, Thomas O.
Thomas, E.
Ward, W. E.
Warne, J. C.
Welty, C. L.
West, John W.
Williamson, Jr., J. A.
Wright, John B.

VISITORS.

Beach, H. L.
Bird, W. Gibson
Cheney, Wm. P.
Christley, J. F.
Darrah, C. B.
Disler, T. S.
Dwyer, J. J.
Estabrook, H. M.
Gilson, George I.
Gwinn, L. J.
Harshman, R. W.
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Homspoon, Vance
Huff, A. B.
Hussong, Jr., A. C.
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Kewley, E. C.
Meyer, F. W.
Milliken, Col. Jas.
Moorhead, Chas. G.
Nicholas, A. D.
Peirce, E. Converse
Pendleton, M. C.
Redding, R. D.
Reynolds, D. E.
Riegler, L. J.
Shaffer, Geo. C.
Shannon, David E.
Smith, Sion B.
Stark, J. D.
Syster, H. M.
Thomas, W. H.
Zimmerman, Wm. D.
Zunic, Joseph H.

The calling of the roll was dispensed with, the record of attendance being had on the registry cards.

The reading of the minutes was dispensed with, by common consent, the minutes being in the hands of the printer.

The Secretary read the following list of applications for membership:

Bail, Cail W., Assistant Foreman, Penna Lines West, Fort Wayne Shop, N. S., Pittsburgh, Pa. Recommended by R. C. Hettler.

Beach, Howard L., Sales Engineer, Clark Car Co., 1639 Oliver Building, Pittsburgh, Pa. Recommended by H. E. Chilcoat.

Beers, W. E., Pipefitter, P. & L. E. R. R. Co., Dickerson Run P. O., Pa. Recommended by Samuel Lynn.

Bird, W. Gibson, Assistant Manager, Pittsburgh Office, Baldwin Locomotive Works, Union Arcade, Pittsburgh, Pa. Recommended by J. A. Spielmann.

Boder, James F., Air Brake Repairman, Penna Lines West, 1110 Liverpool Street, Pittsburgh, Pa. Recommended by George E. Gies.

Boyd, Martin, Work Inspector, Penna Lines West, 819 Melrose Avenue, N. S., Pittsburgh, Pa. Recommended by George E. Gies.

Boyer, F. A., Weldcraft Equipment Co., 701 House Building, Pittsburgh, Pa. Recommended by J. D. Conway.

Buss, Charles, Foreman, Allegheny Shop, Penna Lines West, 948 Lysle Street, N. S., Pittsburgh, Pa. Recommended by George E. Gies.

Clark, Harry B., Air Brake Inst., P. R. R. Co., Fourth Avenue and Hays Street, Derry, Pa. Recommended by W. L. Hudson.

Coho, O. C., Acting Assistant M. M., P. R. R. Co., 429 Rosedale Street, Pittsburgh, Pa. Recommended by R. G. Bennett.

Cunningham, T. C., Foreman, Penna Lines West, 48 Hawley Avenue, Bellevue, Pa. Recommended by R. C. Hettler.

Delo, Will H., Patternmaker Foreman, Penna Lines West, 215 Home Avenue, Avalon, Pa. Recommended by R. C. Hettler.

Estabrook, H. M., Special Representative, Standard Steel Car Co., 1120 Frick Building, Pittsburgh, Pa. Recommended by A. B. Johnson.

Faries, Robert, Division Engineer, Pittsburgh Division, Penna. R. R. Co., 315 East End Avenue, Pittsburgh, Pa. Recommended by R. G. Bennett.

Ferguson, Theodore Sherman, Shop Inspector, P. R. R., P. O. Box 311, Oakmont, Pa. Recommended by C. W. Burket.

Fink, Peter J., Foreman, P. & L. E. R. R., 427 Bigham Street, Pittsburgh, Pa. Recommended by Samuel Lynn.

Gallowich, Louis, Work Inspector, Penna Lines West, 1114 Morrison Street, N. S., Pittsburgh, Pa. Recommended by George E. Gies.

Goehler, F. R., President, Weldcraft Equipment Co., 701 House Building, Pittsburgh, Pa. Recommended by J. D. Conway.

Gross, Chas., Foreman, Penna Lines West, 1314 Liverpool Street, N. S., Pittsburgh, Pa. Recommended by George E. Gies.

Hammill, B. S., B. S. Hammill, 11 Crafton Avenue, Crafton Station, Pittsburgh, Pa. Recommended by F. H. Stark.

Hampson, Vance, Car Repairer, P. & L. E. R. R., Churchill Street, McKees Rocks, Pa. Recommended by Samuel Lynn.

Harger, E. S., Foreman, P. & L. E. R. R., 1115 Second Ave., Coraopolis, Pa. Recommended by Samuel Lynn.

Henry, John F., Acting Assistant Train Master, Penna Lines East, 314 Miller Street, Latrobe, Pa. Recommended by W. L. Hudson.

Hopper, George, Chief Clerk, B. & O. R. R. Co., 3907 Howley Avenue, Pittsburgh, Pa. Recommended by J. A. Spielmann.

Hussong, Albert C., Assistant General Foreman, Passenger Car Inspector, Penna R. R., 349 Ladson Street, Pittsburgh, Pa. Recommended by R. G. Bennett.

Ingold, Guy T., Stationery Storekeeper, P. & L. E. R. R., McKees Rocks, Pa. Recommended by J. C. Gobrecht.

Jones, James W., Foreman, Penna Lines West, 930 Forest Avenue, Belleuve, Pa. Recommended by George E. Gies.

Kaiser, Robert, Foreman, P. R. R., 119 Larimer Avenue, E. E., Pittsburugh, Pa. Recommended by R. G. Bennett.

Kaup, Harry E., Supt., Pressed Steel Car Co., Dakota Street, Bellevue, Pa. Recommended by H W. Elverson.

Manogue, W. T., Salesman, Schroeder Headlight & Generator Co., 937 Fisher Avenue, Philadelphia, Pa. Recommended by F. M. McNulty.

Milliken, Col. Jas., President, Industrial Car Manufacturer's Institute, Union Arcade, Pittsburgh, Pa. Recommended by J. D. Conway.

Milton, W. B., E. H. Foreman, Penna R. R. Co., 128 Shearer Street,Greensburg, Pa. Recommended by R. G. Bennett.

McDonald, J. A., Vice-President, Clark Car Co., 1639 Oliver Building, Pittsburgh, Pa. Recommended by H. E. Chilcoat.

O'Donnell, J. F., Weldcraft Equipment Co., 701 House Bldg., Pittsburgh, Pa. Recommended by J. D. Conway.

Ohle, Carl C., Work Inspector, Penna Lines West, 634 Center Avenue, Avalon, Pa. Recommended by R. C. Hettler.

Peirce, E. Converse, Manager Pittsburgh Office, Baldwin Locomotive Works, 279 Union Arcade, Pittsburgh, Pa. Recommended by J. A. Spielmann.

Perkins, H. E., Levelman, B. & O. R. R., 410 Kambach Street, Pittsburgh, Pa. Recommended by J. A. Spielmann.

Rick, Robert C., E. H. Foreman, P. R. R., 7335 Hermitage Street, Pittsburgh, Pa. Recommended by R. G. Bennett.

Shaffer, William, Assistant E. H. Foreman, Penna. R. R., 114 West Third Street, Greensburg, Pa. Recommended by R. G. Bennett.

Shaw, Vernon V., Chief Clerk to Special Agent, Carnegie Steel Co., 262 Frick-Annex, Pittsburgh, Pa. Recommended by J. A. Spielmann.

Smith, Wm. J., Foreman, Penna Lines West, 1210 Benton

Avenue, N. S., Pittsburgh, Pa. Recommended by George E. Gies.

Taiclet, John A., Wreck Master, Penna. Lines West, 915 Kirkbride Street, Pittsburgh, Pa. Recommended by George E. Gies.

Taylor, Leonard C. G., Assistant Foreman, Penna Lines West, 1702 Irwin Avenue, N. S., Pittsburgh, Pa. Recommended by R. C. Hettler.

Thomas, W. H., Supervising Agent, Pittsburgh & Lake Erie R. R., Connellsville, Fayette Co., Pa. Recommended by Samuel Lynn.

Wescoe, F. B., Assistant General Car Inspector, Penna Lines West, 102 Cleveland Avenue, Avalon, Pa. Recommended by George E. Gies.

White, Charles E., Foreman, Penna Lines West, 1318 Sherman Avenue, Pittsburgh, Pa. Recommended by George E. Gies.

Yoder, F. R., Chief Clerk, P. & L. E., 415 South Ninth Street, Connellsville, Pa. Recommended by Samuel Lynn.

Yohe, Jr., J. B., Superintendent, P. & L. E. R. R., Pittsburgh, Pa. Recommended by Samuel Lynn.

Zunic, Joseph H., Clerk, Penna R. R. Co., 74 Warren Street, Pittsburgh, Pa. Recommended by Alfred L. Mitchell.

PRESIDENT: When these applicants have been approved by the Executive Committee the gentlemen will become members without further action than the payment of dues.

If there is no further business, we come to the address of the evening. We have with us Col. James Milliken, of the Corps of Engineers, Department Military Railways. Col. Milliken is also an ex-president of the New York Railroad Club, so I think he feels perfectly at home with us. It gives me a great deal of pleasure to introduce him to you.

COLONEL JAMES MILLIKEN: Gentlemen, you see before you a scarred and grizzled veteran of the battles of Washington, New York, Hoboken and Norfolk. I did not get over to the other side like a great many of my friends. I wish, like every other man who went into the army that it would have been possible to do so.

I really feel very much honored to be allowed to talk to you tonight and I feel doubly honored to see the large attendance. It really looks like the New York Club, and the New York Railroad Club has about twice the membership you have. I was very much interested in hearing of the occupations of the applicants for membership, which shows that you have a large percentage of actual railway men in your Club and this in turn indicates that it is a very active and progressive Club. I have been associated with the New York Railroad Club for so many years, as an executive member, that I really feel very much at home before the Railway Club of Pittsburgh. Your Club was always held up to the New York Club as a very progressive and active Club. However, I am not here to talk to you about that tonight.

Mr. Chilcoat dropped into my office a couple of days ago and a few minutes later your Secretary happened in, and said: "Now you are here among us and it will be of interest to have you tell the Club what you know about Military Railways. Now I can't make a speech. I never have made a speech. But there is quite a story to tell about the Military Railways' performance in this country, the assistance they gave our armies in France, and I will be very glad to talk to you on that subject.

I wonder if you really know what put us into the war? I do not believe it was the wreck of the Lusitania! I do not believe it was the atrocities in Belgium! I will tell you what I do believe it was. Our Minister, Mr. Girard, had a conversation one day with the Kaiser who said "Girard, we have our submarines going now. We are going to starve out England. We are going to bring her to her knees, they can't help it, and then you Americans look out." Mr. Girard gives this as a positive fact. This country went into war for military reasons, just because the Kaiser said: "You Americans look out!" Had he brought England to her knees, France and Belgium would have been out of it, and we would have been in it. Probably it would have been better if we had gone into it a year or two before we did.

I wonder if we realize what stopped the war! I will tell you. It was force. You gentlemen who saw the parade of returning soldiers today, and you who saw the parades of the 111th and 15th a few weeks ago, saw a very good example of a little bit of that force. There were over two million men on the other side, of which the men you saw were representative—and they were mighty good men. I wonder if you realize what 2,000,000 men mean! It means every man, woman and child, in Philadelphia, Pittsburgh and Baltimore, picked up bodily, taken over to France and transported five hundred miles inland. Everything to support them, all their occupations, their clothing, their food, their shoes, their hats, all the equipment to fight with, and all the equipment to live with. All the factories and everything of that kind had to go too and all the transportation apparatus to carry them.

War is a scheme of destruction. All the cannon that we build, all the projectiles we make, all the rifles we furnish, all the ammunition that goes with them, all the gas and flame, had to be produced for those two million men, in addition to the maintenance they required in that country. All that had to be transported those 500 miles inland after passing the submarines. It was a wonderful undertaking and I do not think any of us realized its magnitude. Probably if I tell you some of my personal experiences it will bring the thing home to you more than if I talked in generalities.

I was, in 1917, Superintendent of Motive Power on the P. B. & W. R. R. and had been home with a bad cold for several days when I received a message from my Chief Clerk, Mr. King. From the tone of his voice I knew he was worried about something. He said: "Mr. Milliken, we have a telephone message that you have been superseded and you are to report to Philadelphia." I did not know what that meant but I went to Philadelphia and reported to Vice-President Atterbury, now Brigadier General. He is a man I have known for many years. We grew up together at the Altoona shops. He said to me: "Jimmie, I have been asked to recruit a regiment of locomotive repair men. Colonel Deakyne, of the 9th Engineers, (which afterwards became the 19th Engineers) has been placed in charge of that regiment and I want you to get in touch with him and outline an all round locomotive repair regiment. We are going to send them over to France because they are desperately in need of locomotive repair men." I went over and talked with Col. Deakyne, who has since become General Deakyne. What I did not know about a regiment of engineers would fill a large book. The only way I could arrive at its construction was to get from the Colonel the outline of an Engineer Regiment and put it down on a sheet of paper. Then we took the three most up to date shops of the P. R. R., viz., Wilmington, Trenton and Renovo, whose workmen represented in numbers about a regiment. At that time a regiment contained 1038 men, exclusive of the officers. We took all the occupations we had in those shops, divided them by three and reduced them to a basis of a regiment of men. Then we analyzed our result and tried to bear in mind what were the probable practices and conditions in France and the fact that France had not had her full quota of men to work on locomotive repairs for three years. Then we sent to Washington and received from the Bureau of Economics a statement of the number of shop employees on all the railroads between New York, Buffalo, Pittsburgh and Washington, and then called on these roads to contribute their proportion of men needed, based on the number that had been reported to us. This was before the draft and so the call had to be for volunteers. My recollection is that the Pennsylvania should contribute about 29%, the B. & O. 20%, and the other roads their proportion, making up the 100%. We asked the Presidents of these roads to have the men report to Philadelphia. Some of the roads responded pretty well; some of them did not seem to pay any attention to our request because they were having trouble at that time getting men for their repair shops. Because of the rates paid at munitions plants the railroads were all short of locomotive repairmen as well as all kinds of workmen. The result of this was that we finally had to make a second call on the Pennsylvania and the B. & O. The Pennsylvania finally contributed about 42% and the B. & O. about 30% of the regiment. The Pittsburg Division contributed more than its quota.

The regiment was recruited first at Thirteenth and Sansom Streets and later at the old Museum, 34th and Woodlawn Avenue, Philadelphia, and there was a quizmaster right at the stations. Over 3,600 men volunteered. This quizmaster, and an Army Surgeon, turned down all but 1,038 either because they did not know their job, or were not big enough all round mechanics, or they failed to pass the physical examination of the army; and I tell you they were the finest lot of men I have seen in my life.

Just about the time these men recruited, we received a telegram from Mr. S. M. Felton, who had been appointed Director General Military Railways, that they should be equipped with hand tools. Then we had to skirmish around to see what were hand tools for a regiment of locomotive repairmen. We dug that out in short order. Very soon after that Mr. Felton telegraphed General Atterbury asking that I meet him and Major Garrett, who had just returned from France, in New York. About the middle of May a commission of four railway experts had been sent to France to investigate railway conditions. This was known as the Parsons Commission and consisted of Col. Parsons, Col. Wilgus, Major Garrett and Major St. Phalle. Major Garrett returned and made a report to Mr. Felton telling a great deal about the situation in France. They had enough locomotives and enough cars and had maintained them pretty well but they could go no further. They had made the mistake of allowing too many of their expert railroad men to enlist in the army and they went into the trenches and were killed.

A little later we had a report from Major St. Phalle, a member of this Commission and an Officer of the Baldwin Locomotive Works, who had devoted his time in France exclusively to the locomotive and car situation. He emphasized the fact that the railroads had been maintained so far but they could go no further. Just about that time a cable came from General Pershing saying that these shop men would be assigned to Nevers shops. They were large new shops that had been nearly completed before the war and which would be completed in three months. There was nothing in them and we were asked to supply all the tools and everything else that went with those shops.

Twenty-seven of the thirty-five officers of the 19th Engineers were college men, technical engineers with practical training on some one of the big eastern roads. I called these Officers together and said: "This shop is yours. Tell me what you want and I will get it." They went to Wilmington, Trenton, and West Philadelphia, and made a record of all the shop tools in those shops, all the appliances, and all the stock that was carried. They averaged that up and said we need overhead cranes, jacks, storehouse supplies, lighting fixtures, machine tools for the tin shop, boiler shop, blacksmith shop, erecting shop, machine shop, cabinet shop, power plant, and everything that goes with it. This was all furnished in good time. Our people on the other side and the French, with whom I was closely associated at Washington, told me that it is the finest locomotive repair shop in the world.

The 19th Engineers sailed for France July 9th. Just about that time Mr. Felton asked me to come to Washington as his Mechanical Aide. Just here I would like to say a word about Mr. Felton. He was and is President of the Chicago Great Western Railroad. He was known throughout the country as the Doctor of Railroads. He had taken over a great many railroads in the hands of receivers or just on the verge of a receivership and built them up into real railroads. He was a man pretty well up in years, big physically and a great big man in brain. When you consider his years, his performance was something wonderful. He was at the office every morning early. He was about the last man out and he always took home a big envelope under his arm and the next morning he would tell us the right thing to do.

When I reported to Mr. Felton in Washington he said: "We want you to go right ahead and get these tools for the 19th Engineers, and we have many other things to get." I said: "How are we going to do this? The way it is done in the army or the way we do on the railroad in an emergency?" He replied: "I have arranged that with the Secretary of War and we are going to do this like we do on the railroads in emergency. You go up and talk to Colonel Rose, since Brigadier General Rose, and arrange the details." When I appeared in Washington, Mr. Felton's organization consisted of himself; Colonel Tyler, a regular army engineer; Colonel Molitor, who was a constructing engineer from New York and a good railroad man; myself; two stenographers; and a messenger boy. Colonel Tyler looked after the details of the personnel and was the Military Aide. In addition to getting all the supplies for the entire equipment that was to go to France, Mr. Felton looked after all the personnel for the operation of those railroads, and he vised personally all the men who were given commissions for the railroad engineers. It was some big job!

I went up and had a talk with Colonel Rose and he said: "No, we can't do this, we can't do that, we can't do the other thing," and he explained why. He is one bright, clear minded man, and he later was placed in charge of the purchase of all the supplies for the United States Army. He explained that not only the Engineers but the whole United States Army was required by laws of Congress to make purchases by certain methods and they could not go out and buy a thousand locomotives or a dozen lead pencils without advertising for bids. They could not do a great many things that we as railroad men would do in emergency. Now I am not saying this in a spirit of criticism of the army or of the laws but am just stating to you the actual conditions. Those things were not possible! General Rose and I wrote a memorandum to Mr. Felton, saying that we understand you desire that we should do so and so. To do this, because of the laws of the United States, we must have special authority from the Secretary of War.

Just here I would like to say this. During the entire period of the war there was never a time when the Military Railways did not have more material at the docks than it was possible for the ships to float. The reason this was so was due to Mr. Felton. We took that memorandum to Mr. Felton. He said: "No, this is not right. It is not broad enough. I will change it." That was always his way. It was not broad enough! So he rewrote the memorandum and said: "I will take this up to the Secretary of War." I went back to Philadelphia and in the course of a couple of days I called General Rose on the telephone. Nothing had been heard from the memorandum. He said

"To be candid, Mr. Felton has been away from town and is just back this morning and he is going to see the Secretary today." I replied: "If he gets that signed, telephone me." A couple of hours after that the telephone rang and I recognized General Rose's voice saying: "Do you know, the Secretary signed that memorandum. Do you know what that memorandum said? It said that Mr. Felton, Director of Military Railways, has authority to purchase and produce all items for railways in any manner he sees fit!" That is the reason the Military Railways always had material waiting at the docks. Mr. Felton said to me: "Mr. Milliken, we are going to produce. I will offer no excuses for non-production, and I will accept none."

We had no organization at that time to purchase or produce and until we had our organization perfected we called on some of our friends. Gen. Atterbury turned over the P. R. R. Purchasing Agent Department to us. He turned over Mr. I. B. Thomas, Assistant Purchasing Agent to us saying: "Mr. Thomas, this is your job. Go after it and get what the Military Railways want."—and Thomas did the trick! Within about a year he delivered over $5,000,000 worth of tools. Hand tools and shop tools for the A. E. F. When you realize that the average hand tool costs about $1.50 and shop tools, planers, shapers, drill presses, and things of that kind, about $1500, you may realize what $5,000,000 means in the purchase of tools.

When it came to the purchase of car shop equipments we called on the Standard Steel Car Company to tell us what we should have for a complete car shop to erect cars at the rate of 120 a day and they told us. We asked them to go out and buy them and their Assistant Purchasing Agent, Mr. W. H. Mateer, at Butler was given the job, and he, like Mr. Thomas of the Pennsylvania, did the trick. The materials were all at the docks before they could be shipped. They were not shipped over promptly simply because there were not enough ships.

As I said before, all the instruments of war are for destruction, except transportation, and that is for construction. Probably everything we bought and delivered, except some of the light railway track and equipment, is going to be useful in France, Belgium, Germany, Switzerland, Italy, Roumania, and all the countries that have been devastated.

I would like to say a word about what took place on the other side although I ought not to emphasize it because there will be men before you later who were there and are better qualified to speak than I. What we did was a lot! However, it cannot be compared with what was done on the other side. Gen. Atterbury went over there and was made Director General of Transportation. He is the man who was really responsible for the success of the armies on the other side. Remember the French had said: "We are done, we can do no more!" Here were all those two million soldiers and all the things that had to go with them to the front. It was Gen. Atterbury, with the assistants that went over from this side, that did it! It was a wonderful undertaking! A wonderful accomplishment! I understand Gen. Atterbury was cited for overcoming "Insurmountable obstacles." In charge of the locomotive and car department was Col. Maxfield, a member of this Club. The army officers who have come back have said that Maxfield did wonders. He was there right on the job, on top of it!

I might interlude a little on the Nevers shop. In France a locomotive repair shop of 1200 men turned out about seven general repair locomotives per month. After the war was under way they realized that they would have to improve that and they put it up to twelve a month. After Maxfield got his Nevers shop going with his 19th Engineers, I think the best he did in any one month was fifty-two general repairs. And these men who did this were not working piece work, making $125 to $150 a month. They were getting $30 a month and their clothes and board. That is what the A. E. F. did for locomotive repairs.

To come back to the work on this side; soon after we received the authority to produce there came a cable from General Pershing, July 15, 1917, saying: "We must have 300 locomotives in France by October 15th to take care of us through the winter." We called the American Locomotive Company and The Baldwin Locomotive Works together and gave them a contract for 150 locomotives each, the Baldwin Works for the same type they had been building for the British and the American Company for the same type they had been building for the Paris, Lyons & Mediterranean Railroad in France, so they could produce quickly with the patterns and formers and dies they had. This order was given to them verbally on the 17th of July and 20 days later, 20 working days, the Baldwin Locomotive Works produced the first locomotive fully painted, fired up, and ready for its trial trip. That broke the record in America. The 300 locomotives were at the dock ready to go to the other side on the 15th of October. That is where another American record was broken.

About that same time we were asked for cars, and as we look back, some odd things happened. The first cable called for 17,000 ten ton freight cars to be equipped with air brakes and American couplers. That looked rather odd to us so we started a correspondence by cable and finally persuaded our friends in France that we should give them 30 ton cars with French appliances so they would be interchangeable with the French equipment but built as closely to American standards as possible, because that would increase production. They needed ability to carry tons, so we reduced the number of cars from 17,000 to 6,000 and furnished all classes of car equipment. Sometime before, the Council of National Defense had appointed a Car Committee on which were representatives of the majority of the large car builders. We called this Committee together, they worked like Trojans, so that very promptly we were able to design a car that could be built by all the American manufacturers and yet would comply with all the French standards. In building this equipment of locomotives and cars we built the very largest that would meet the French clearances. If you exceeded the clearance diagram, your car stopped right there; there was no recall. The French are very precise. I remember we had to cut the flanges of the cylinders a little bit and we had to shorten up a little bit on the nuts for the crank pins to meet their clearance. I mention this because the Americans wanted to haul tons and there was a tremendous lot of it to be hauled

—7 tons per man per year, exclusive of the railroad equipment. You can figure that out yourself!

The 35th Engineers was a regiment that had been recruited to go to France and erect these 6,000 cars that had been ordered. There was no shop or equipment over there for them at all. The Standard Steel Car Company, as I said, had laid out the shop and purchased the materials and equipment and that stuff was all at New York at the time the regiment was ready to sail. Unfortunately we could not always put equipment on the same ship with the troops. You cannot load big cranes and big stationary boilers and powerhouse equipment on passenger boats! That had to go on freighters. The result was the 35th arrived in France without their tools and equipment: but this they finally received. They went over in February 1918 and they built a shop, put in the tracks, erected all the tools, all the power plants, all the buildings necessary to do the painting, and by the time the Armistice was signed they had erected 18,300 cars. A regular army officer, Col. Waldron, was the head of that regiment. He is a fine man, a good officer, he knew all about army regulations, he knew all about army engineering, but he never had been a car builder. Lieut. Col. Vincett went over with that regiment and to him is certainly due all honor for erecting 18,300 cars, an average of 2700 cars a month. I think their day record was 152 cars erected. They are all friends of yours, boys largely from the Pittsburgh District.

I think here I might say a word about the cables, just to show you how difficult it was to transact business. We were separated by 3,000 miles. Any of you who have done business in France or England know the difficulty you are up against just because you are so far away. Cable correspondence, as you can readily imagine, was tremendous; and to prevent overburdening the lines the messages had to be short. Many times we were left very much in the dark as to what was wanted. We would get a cable saying we want ten enginehouse equipments. It was up to us to decide what were ten enginehouses for use in France. Another cable; we want a five ton iron foundry with brass foundry attached. Ship by first steamer. Let us know the steamer it comes on. To keep our friends on the other side straight we gave a great deal of attention to these things because we realized the tremendous difficulties they were having. We bought and had delivered to a certain dock in Philadelphia an entire foundry equipment from the cupola down to the dusting bag one shakes over the flasks. We sent an officer up there and said: "You sit tight on this job until every item is on board ship. He stayed there and that entire equipment was shipped in about six weeks. I think we received the request for the foundry about the first of February and it was shipped about the middle of March. Along in August a man from the other side came into my office and we were talking about things that were lost over there and particularly about the light railway shops and equipment we had shipped. I told him about shipping this foundry over. I said: "That is one thing that ought to have gotten there because it was all loaded on one ship." He said: "But do you know that d——d foundry was lost? We have never been able to find it." As a matter of fact he was mistaken as I afterwards learned the foundry was in operation. But it had actually been lost over a month. It was sent to some storage place intact and it took about a month to locate it and get it reshipped away to this new light railway shop.

At the signing of the Armistice last fall we were really just getting into our stride. I do not believe anyone in July or August thought for a moment that the war was going to end last year. All the plans were that we would smother the Germans this year. The plans were to have four million men over there by June of this year. All the equipment that had been ordered was to be delivered by that time. At the time of the signing of the Armistice we had shipped about 18,800 cars and we had 74,000 more building and on order. We had shipped about 1300 of these big locomotives and we had 2300 more on order. They had cabled to us; we must have locomotives delivered at the rate of 300 a month and cars at the rate of 8500 a month. In September, October and November we were actually delivering and shipping 300 locomotives a month out of the Eddystone plant of the Baldwin Works; 150

of these were set up and 150 were boxed and had to be set up on the other side. We were prepared to ship cars to get the total of 92,000 over by the first of June and at a rate of 11,500 a month. That exceeds all production of locomotives and cars ever thought of in the United States.

I would like to tell you a little about the shipment of set up locomotives. When the war broke out we were shipping locomotives in 19 different boxes to be erected on the other side. Boilers in one box, frames in another, all the different parts in these 19 different boxes. We learned that the British were shipping across the Channel locomotives set up complete. We thought we should be able to ship that way from here. Shipping people said it might be done across the English Channel but it could never be done across the Atlantic. The engine builders said the same thing. I had a hunch that it could be done. Maybe some of you know Mr. Dan Brady of New York? In his office one day he handed me a card which said: "Things are moving so rapidly these days that the man who says it can't be done is often interrupted by some one doing it." I thought that a pretty good motto and I had some of them sent to me. Everytime one of those fellows said we couldn't ship locomotives set up, I shook one of these cards at him. We tried to get ships but could find none with sufficiently large hatches. One day we heard of two large ferries being used between Key West and Havana to haul cars and that was just what we wanted; run the locomotives on these car ferries, ship them over to the other side, back them off, fire them up, and let them go. After talking with Mr. Munn of the Cramp Ship Building Company two or three hours, he said it could be done. He decided that in the course of three months they could make those boats sufficiently seaworthy. We put this up to the Shipping Board and found we could not get the boats as they had to be continued in use between Key West and Havana. Then we heard of a boat used as a car ferry on the St. Lawrence. This boat was claimed as not seaworthy. As a matter of fact the boat was built in England and brought to the St. Lawrence; later she was shipped from Quebec back to England and used there to carry cargo across the Channel. Later on we did discover that there were some ore boats plying between Baltimore and Cuba that did have big hatches and the Shipping Board gave us one of them for a trial trip. We loaded 1600 tons of rails on the bottom of that ship covering them with plank. We had the Baldwin people build some locomotives complete and ship them on their own wheels to New York. The only thing taken off was the cab, a good heavy box being used to cover the cab fittings. We took down the main and side rods, and part of the Walschert gear, placing the parts in the fire box. We put the cab in the tender coal space. The locomotives were dropped down in the hold and set on the planks, the brakes were set with hand screws and the locomotives were blocked across ship with 8x10-inch stringers. The spaces between the locomotives were filled with triple compressed hay. The tenders were placed on top of the locomotives and blocked in the same manner. When 33 locomotives were placed in the hold of this first ship, about 70 automobile trucks were placed on top of the tenders and on the deck. The ship was well filled up. That was a 10,000 ton boat and we put about 8,500 tons on her. The value of the cargo was about $2,500,000. I put an Officer, Capt. A. W. Byron, on the boat to boss the loading and believe me he had some time with the men that did the actual loading. They did not believe this thing could be done. But it was done and he went to France on the ship. You should have seen the messages that came back from Gen. Pershing! That settled the question of shipping locomotives set up. After that it was a question of the Shipping Board preparing the ships fast enough with these big hatches to load the locomotives! If the Armistice had not been signed, in another couple of months we would have been shipping 300 locomotives per month set up. We were called on to ship cars set up. That, we never did but it was all schemed out and we soon would have been doing it.

I wonder if you actually realize the amount of things that were actually shipped to France! That was the reason the Kaiser stopped when he did. It was that show of force, the number of men, all the cannon, ammunition, and all the equipment; not only what was on the other side but what the Kaiser's agents here saw was being produced. The fact that ships were being built so rapidly also carried much weight. Our navy so protected the vessels that few ships of any moment were sunk. Germany did get quite a number light vessels coming back to this country. Of the railway equipment, there were only three boats caught loaded going over. One of them had 10 locomotives on, another had a couple of hundred cars, and another had quite a load of locomotive cranes.

The crane situation over there is one of great interest. We had prepared 76 gantry cranes to handle material from ships to the docks that were being built by our forces. There are not half a dozen gantry cranes on our coasts, so you can realize what 76 would have meant in unloading vessels on the other side. They were not all in service before the signing of the Armistice but they have all been shipped over since and will be used by the French. There were some 500 locomotive cranes shipped of ten to fifty tons capacity. At the signing of the Armistice there were some 450 additional building and on order. Our boys built on the other side and put in service 932 miles of railway track. We were shipping rails at the rate of 72,000 tons a month. We had over 450,000 tons of rail and turnouts on order with all the paraphernalia that goes with it. I think there were some 67,000 railroad men in France at the time of the signing of the Armistice. Gen. Atterbury's program, to be completed by June, called for 200,000 railroad men with 6,000 officers.

At the signing of the Armistice—you all remember what a day it was when the Armistice was signed! Everybody stopped work. The next day in Washington there was a most surprising situation developed. Prior to that time everyone had been up on his toes, working hard; Sundays, holidays, nights, without stoppage. The day after, everything was flat. Nobody seemed to care to do a thing. In fact, there was little to do until we learned from the other side what their requirements would be. The cables were mysteriously quiet. No messages arrived for about four days and then the cables began to come and they all said "Cancel." Cancel locomotives, cancel cars, cancel cranes, cancel shops, cancel shop tools, etc. We were tired of that word cancel! And it was some job to cancel. When you are producing cars at the rate of 11,500 a month and locomotives at the rate of 300 and everything else in proportion, to say nothing of the light railway equipment that was used at the front, it is easy to say cancel but an entirely different thing to do.

They have over there what is called the rail head; the point the standard gauge tracks stop, fifteen or twenty miles back of the trenches. From there to the front they handle all the material with 60 centimeter gauge equipment (23⅝"). Prior to the Armistice, about 500 of these narrow gauge locomotives, both steam and gasoline, and between 4,000 and 5,000 cars, had been shipped; and we had about three times that number on order when the Armistice was signed.

In addition to the big repair shops I told you about we had furnished 12 standard gauge enginehouses complete and 10 narrow gauge enginehouses. They wanted 24 additional enginehouses because they expected to go right into Germany and that meant an additional 300 miles haul. There was ordered 10 more of the narrow gauge enginehouses, a 50% addition to the light railway repair shops and another complete light railway repair shop. As I have said; —it was force that made the Kaiser quit!

I would like to say just a word about the cooperation of the railroad people in this country, I mean the railway equipment manufacturers. We were using all the locomotive builders in the country, we were using all the car builders in the country, and without exception they all turned over their entire facilities. They worked day and night when called to, they stopped entirely when we advised that the ports were being clogged, they did exactly what we asked them to do ,and they always delivered the goods.

Gentlemen, I have talked a long time; I think I have given you a few of the points of real interest and I appreciate your giving me this opportunity to tell this story to you.

PRESIDENT: I am sure we appreciate the opportunity of hearing this story first hand, in a conversational way and not a technical discussion. A great deal of it is, of course, a surprise to us. Are there any remarks?

MR. E. EMERY: I was very fortunately able indirectly to come in contact with the speaker during some of the work he was doing and I do not believe we all realize what the details of this work amounted to. He has talked in big figures of what was produced. The detail work he has not touched on at all. Neither has he touched on the master mind that directed it, that controlled all that work. And I may say to you, that the Mechanical Aide to Mr. Felton is the man to whom all such credit should be given, and in substantiation of that we have with us a man who worked with the Colonel very closely and has known something of what he has done. When he was speaking about Mr. Felton being pretty nearly the last to go and the first to come, the Colonel was the first to get there and the last to go. But we have with us Mr. Shaw who has had quite a little to do with the Colonel and I do not believe it would be out of place to call on him to explain what all this means relative to the personal work of the Colonel and the details of the organization and the production of this material which was necessary to get this material 500 miles from the shore line in France to our forces.

PRESIDENT: We would be very glad to hear from Mr. Shaw.

MR. G. M. SHAW: I do not believe that I could add anything to what has been said. I can only say that I do not believe they could have gotten any one in Washington to work any harder than he did or accomplish any better results. I think everyone responded in every way they could.

PRESIDENT: We have right here in the Club a gentleman who had a great deal to do with this car feature and he is a good speaker. We would like to hear from Mr. Lindstrom.

MR. CHARLES LINDSTROM: I regret very much being compelled to say that I am not the car man you refer to. Our Company had very little to do with it. We only built the cars as they were ordered from us and I personally was not connected with it. I am very sorry myself. I wish you would call on some one like Mr. Johnson of the Standard Steel Car Co.

PRESIDENT: May we hear from Mr. Johnson?

MR. A. B. JOHNSON: I have listened with a great deal of interest to Col. Milliken's talk. I do not know that there is anything I can add to it. All the car builders co-operated fully. We all entered into the spirit of it, we all felt that it was necessary to put forth our best efforts to help the country win. I really don't know that there is anything to be added.

PRESIDENT: I know the car works at Butler got a great deal of credit for what they did. I understand they are still turning out cars over there but not putting any letters or numbers on the sides of them.

MR. D. J. REDDING: It seems that these men who built the cars and locomotives are unwilling to take any credit for the work they did. I think we all appreciate from what the Colonel has said that they must have been working nights and Sundays to get this equipment out. Very few of us can appreciate the tremendous strain under which they did the work. We forget quickly. Everybody during that period was working at an excessive speed as compared with what we are doing now or did before. But we soon forget. We take up the ordinary routine again and are glad to do it. Some of the things the Colonel brought out here, however, when they have soaked in will make us realize why the Kaiser quit. He would have been licked, he would have been smothered. They would not have had room for all these locomotives and cars in Germany. He would have been driven over into the ocean before we got through with him.

I think it is a wonderful tribute to the manufacturing and transportation interests of this country to make the showing he so beautifully outlined. This of sending 300 locomotives out of one shop in a month, 12 a day, in addition to keeping up their own shops. I think the very least we can do is to offer a rising vote of thanks to the Colonel for his very interesting talk which we will appreciate even more when we come to read it in the Proceedings. I offer that motion.

COLONEL MILLIKEN: I might tell you just one little incident. The latter part of August we received a cable saying: "We want six flat cars of sufficient capacity to haul sixteen inch guns from the front back to the repair shops." That was all! We found out the weight of those guns and we knew they were only allowed 20 metric tons per axle, so that meant double truck cars, that is double trucks at each end of the car and about a 60-foot car. We thought it possible that we might find some cars in this country that had been used for hauling the heavy guns and we wasted about a week in finding out that there wasn't any such animal. They said two of these cars must be shipped in September. On the 12th of September we gave an order to the Standard Steel Car Company for six cars, they to design the car, which had been outlined to them, produce and get to the port so as to ship in September. Well they did it. The two cars were out of the shop and on the way to New York on the 30th of September.

PRESIDENT: I would like to say to the Colonel that I think all our railroad people sweat blood also hauling coal, hauling ore, hauling troops, and all the material that was going across. We had to do it often without any notice at all and put everything else on the sidetrack to carry this stuff when we knew it was piling up down there and could be just as well, if not better, sent a week or two later.

Mr. Redding's motion for a rising vote of thanks was duly seconded and prevailed by unanimous vote.

In the absence of Mr. Amsbary, Chairman of the Entertainment Committee, the President called upon Secretary Conway for report of finances in connection with Theater Party at the Alvin on the evening of April 22, 1919.

The Secretary reported that receipts were not all in from advertisements in the Souvenir Program hence a final report could not be made. He stated however that the Club would probably clear about $2,000 from the show.

There being no further business,

ON MOTION, Adjourned until the fall meeting.

J. D. CONWAY, Secretary.

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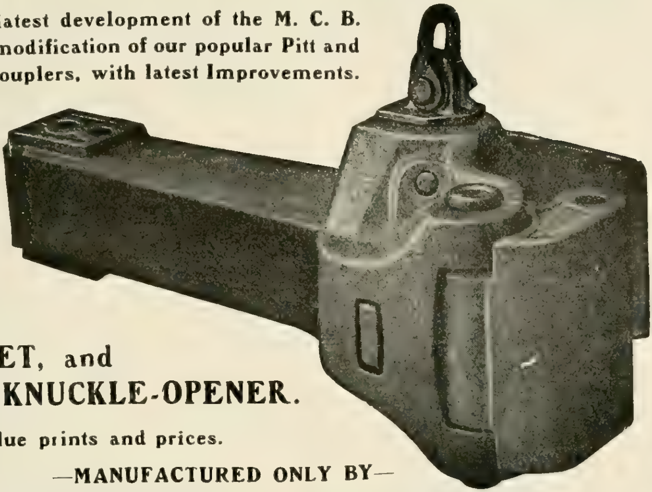

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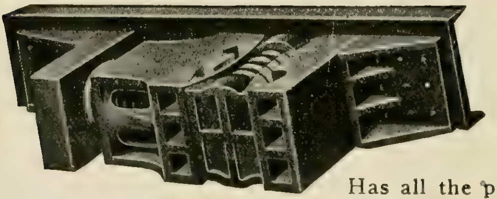

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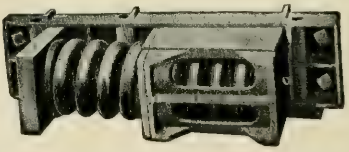

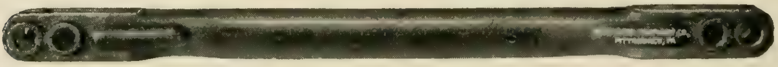

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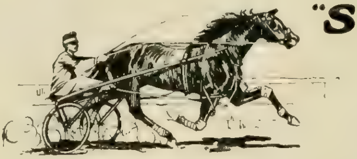

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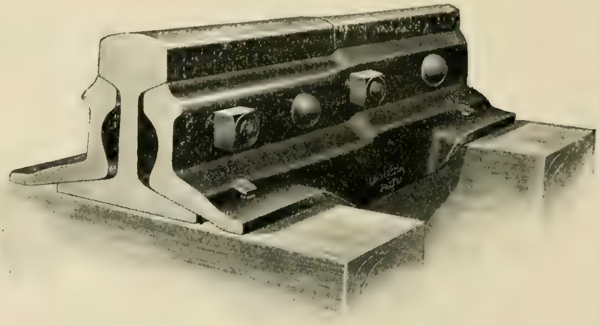

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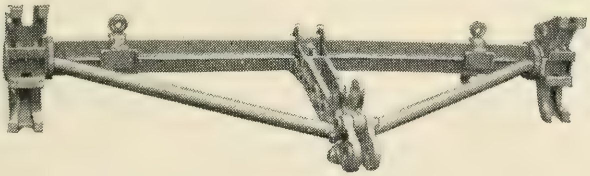

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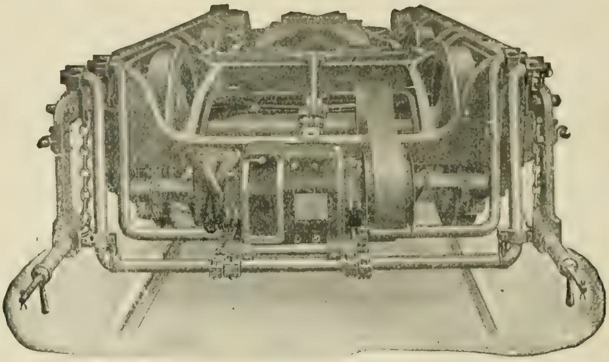

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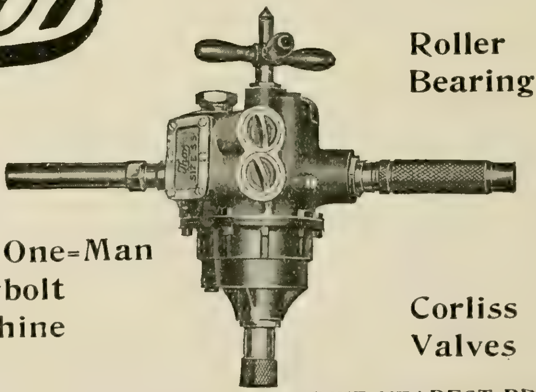

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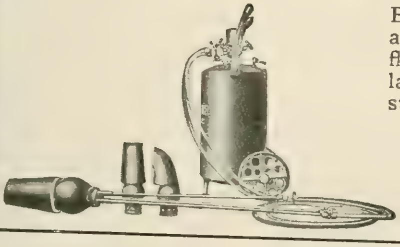

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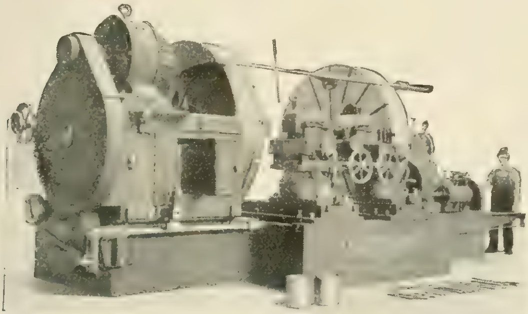

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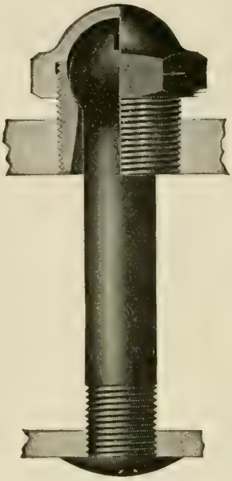

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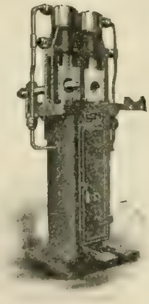

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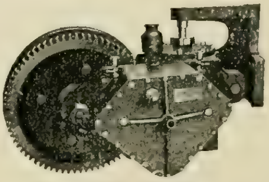

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RAILWAY CLUB NOTES.

The following subjects were presented and discussed by the several Railway Clubs, during the month of September, 1919, as noted below:

New York Railroad Club, Harry D. Vought, Secretary,
95 Liberty Street, New York, N. Y.

SUBJECT—"Purchasing and Stores Organizations," by H. B. Spencer, Director of Purchases, U. S. Railroad Administration.

New England Railroad Club, Wm. E. Cade, Jr., Secretary,
683 Atlantic Avenue, Boston, Mass.

SUBJECT—Not received.

Richmond Railway Club, F. O. Robinson, Secretary,
Richmond, Va.

SUBJECT—Not received.

St. Louis Railway Club, B. W. Frauenthal, Secretary,
Union Station, St. Louis, Mo.

SUBJECT—"Railroad Reorganization in the Interest of Public, Owners and Employees," by Doctor William G. Raymond, Dean of the College of Applied Science of the State University of Iowa.

Southern & Southwestern Railway Club, A. J. Merrill, Secretary,
Box 1205, Atlanta, Ga.

SUBJECT—"Sufficient and Efficient Lubrication of Superheat Locomotives," by Dr. P. H. Conradson, Galena Signal Oil Company.

Central Railway Club, Buffalo, N. Y., Harry D. Vought, Secretary,
95 Liberty Street, New York, N. Y.

SUBJECT—Not received.

Canadian Railway Club, W. A. Booth, Secretary,
131 Charron Street, Montreal, Canada.

SUBJECT—"Why Is a Hot Box," by E. J. McVeigh, General Storekeeper, Grand Trunk Railway System.

Pacific Railway Club, Wm. S. Wollner, Secretary,
64 Pine Street, San Francisco, Cal.

SUBJECT—Not received.

Western Railway Club, A. F. Steubing, Secretary,
750 Transportation Building, Chicago, Ill.

SUBJECT—"Railway Train Lighting," by E. Wanamaker, Electrical Engineer, C. R. I. & P. R. R.

The Railway Club of Pittsburgh, J. D. Conway, Secretary,
515 Grandview Avenue, Pittsburgh, Pa.

SUBJECT—"The Economic Disposal of Waste Material," by Major Howard L. Beach, Clark Car Company, Pittsburgh, Pa.

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OFFICIAL PROCEEDINGS

OF

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Pittsburgh, Pa., Sept. 25, 1919
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Pittsburgh, Pa.

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President, Fort Pitt Mall. Iron Co.
Pittsburgh, Pa.

Second Vice President
SAMUEL LYNN
Master Car Builder, P. & L. E. R. R.,
McKees Rocks, Pa.

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J. D. CONWAY
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Past Presidents

J. H. McCONNELL	October, 1901, to October, 1903.
L. H. TURNER	November, 1903, to October, 1905.
F. H. STARK	November, 1905, to October, 1907.
* H. W. WATTS	November, 1907, to April, 1908.
D. J. REDDING	November, 1908, to October, 1910.
F. R. McFEATTERS	November, 1910, to October, 1912.
A. G. MITCHELL	November, 1912, to October, 1914.
F. M. McNULTY	November, 1914, to October, 1916.
J. G. CODE	November, 1916, to October, 1917
D. M. HOWE	November, 1917, to November, 1918.

* Deceased.

Meetings held fourth Thursday of each month, except June, July and August.

PROCEEDINGS OF MEETING
SEPTEMBER 25, 1919.

The meeting was called to order in the Americus Club House, Pittsburgh, Pa., at 8 o'clock, P. M. with President Spielmann in the chair.

The following gentlemen registered:

MEMBERS.

Adams, L.
Amsbary, D. H.
Anderson, A. E.
Anderson, Harry T.
Arnold, J. G.
Beach, Howard L.
Bird, W. Gibson
Blakely, W. W.
Boder, James F.
Branson, C. R.
Brock, Jesse
Chilcoat, H. E.
Christy, F. X.
Clark, C. C.
Clark, Chas. H.
Clark, Harvey
Courtney, D. C.
Cox, Wm. C.
Crenner, J. A.
Cromlish, W. L.
Crookston, W. G.
Cunningham, H. R.
Daly, P. J.
Dambach, C. O.
Donahoe, F. F.
Duffy, John F.
Dunn, James
Durant, C. H.
Emery, E.
Fendner, W. J.
Fink, P. J.
Forrest, C. H.
Frey, A. P.
Gallowich, Louis
Gies, George E.
Graham, J. H.
Grewe, H. F.
Gross, Chas.
Hampson, Vance
Haynes, J. E.
Hoffman, C. T.
Hopper, George
Howe, D. M.
Howe, Harry
Huber, H. G.
Hueston, Wm. F.
Hyndam, F. T.
Johnson, Bradley S.
Johnson, John F.
Jungbluth, A.
Kaup, H. E.
Kinch, L. E.
King, Jr., C. F.
Lanahan, Frank J.
Lanahan, J. S.
Laughner, C. L.
Laurent, G. F.
Lawson, A. F.
Lent, John F.
Lindsay, G. W.
Lindstrom, Charles A.
Lobez, P. L.
Long, H. P.
Long, R. M.
Lynn, Samuel
MacKinney, Morgan
Maisch, Geo. J.
Manogue, W. T.
Mason, R. L.
Matchett, H. K.
Mathison, J. E.
Merscher, John
Millar, C. W.
Miyasaki, Y.

Moyer, Oscar G. A.
Murtland, D. L.
Myers, W. H.
McConn, G. E.
McConnell, P. L.
McGregor, S. S.
McNulty, F. M.
Nelson, W. O.
Oiyen, E.
Painter, Joseph
Pehrson, Alf. K.
Peirce, E. Converse
Price, W. T.
Proven, John
Redding, D. J.
Reich, F. C.
Robbins, Frank S.
Rosenstock, J. H.
Sattley, E. C.
Seiss, Wm. C.
Simonson, S.
Smith, F. C.
Snyder, Jos.
Snyder, R.
Snyder, W. H.
Spear, A. E.
Spielmann, J. A.
Stark, F. H.
Stauffer, A. H.
Strome, H. H.
Stucki, A.
Sturmer, Geo. W.
Styers, J. V.
Sutter, Chas.
Swift, W. G.
Taiclet, John A.
Ward, W. E.
Wescoe, F. B.
West, John W.
Williamson, J. A.
Wilson, D. L.
Wright, John B.
Wright, Roy V.
Żunic, Joseph H.

VISITORS.

Baker, S. S.
Bender, H. M.
Bhimof, J. A.
Clark, A. E.
Fowler, W. E.
Galloway, C. L.
Gilson, George I.
Gullormsen, B.
Hale, Chas. E.
Halleran, H. J.
Halleran, John L.
Hambrock, O. F.
Hammerstrom, R.
Hanna, R. B.
Hemmens, T. R.
Holmes, C. W.
Hueston, J. H.
Keagy, C. O.
Kelly, J. R.
King, Jr., J. W.
Knoll, George
Krogh, F. F.
Mason, Russell P.
McCabe, C. P.
McIntire, A. H.
McIntire, Mrs. A. H.
Nicholas, A. D.
Nicodemus, E. H.
O'Malley, L. J.
Pokorney, J. J.
Prern, Walter H.
Rankin, Ned W.
Redding, P. E.
Rush, Benj. H.
Sheets, F. A.
Straub, W. C.
Sullivan, A. C.
Tyman, J. F.
Webster, F. D.
Wilson, H. G.

The reading of the minutes was dispensed with as they will appear in the printed Proceedings.

The President announced that this is the meeting at which it is necessary to appoint a Committee on nominations, and appointed as that Committee Messrs. John S. Lent, Harry Howe and Joseph Snyder, with request that they make a report before adjournment of this meeting.

The Secretary read the following list of applicants for membership:

Bain, W. J., Shipper, Universal Portland Cement Co., Universal, Pa. Recommended by R. S. Wilson.

Bartholomew, W. S., V. P., Westinghouse Air Brake Co., Wilmerding, Pa. Recommended by H. E. Chilcoat.

Bowers, John M., Clerk, Union R. R. Co., 601 N. Beatty St., Pittsburgh, Pa. Recommended by R. S. Wilson.

Briggs, Z. M., Assistant Engineer, Penna. Lines, 1119 Union Sta., Pittsburgh, Pa. Recommended by W. L. R. Haines.

Dehne, G. C., Assistant Secretary, Westinghouse Air Brake Co., Wilmerding, Pa. Recommended by H. E. Chilcoat.

Dette, R. E., Foreman, P. R. R. Co., 28 Grape St., Pittsburgh, Pa. Recommended by C. B. Gray.

Dixon, C. P., Assistant T. M., P. R. R. Co., Lines East, 527 Sixth St., Oakmont, Pa. Recommended by T. M. Blakley.

Fairgrieve, E. N., District Car Distributor, B. & O. R. R., 7230 Monticello St., Pittsburgh, Pa. Recommended by C. H. Durant.

Farmer, C. C., Director of Engineering, W. A. B. Co., Pittsburgh, Pa. Recommended by H. E. Chilcoat.

Fieldson, P. H., General Foreman, P. & L. E. R. R., Vanderbilt, Pa. Recommended by F. H. Stark.

Flatley, Wm. J., Supervisor, Monongahela Conn. R. R., 3540 Second Ave., Pittsburgh, Pa. Recommended by O. G. Ferguson.

Galloway, C. L., Representative, Hunt-Spiller Mfg. Corporation, 383 Dorchester Ave., Boston, Mass. Recommended by J. A. Spielmann.

Ganz, Chas. A., Gang Leader, P. R. R. Co., Station St., Penn, Pa. Recommended by J. F. Courson.

Gaw, F. W., Manager Pneumatic Tool Department, Pittsburgh Branch, Ingersoll-Rand Co., Chamber of Commerce, Pittsburgh, Pa. Recommended by G. B. Raser.

Gorsuch, C. B., Superintendent, B. & O. R. R., Pittsburgh, Pa. Recommended by J. A. Spielmann.

Grove, Paul L., Superintendent, Penna R. R. Co., Monon. Division, S. S., Pittsburgh, Pa. Recommended by A. Stucki.

Hale, Chas. E., Salesman, Baldwin Locomotive Works, 279 Union Arcade, Pittsburgh, Pa. Recommended by E. Converse Peirce.

Hanna, R. B., C. C., P. & L. E. R. R., Windgap Road, McKees Rocks, Pa. Recommended by F. C. Smith.

Harbourt, J. C., Chief Publicity, Westinghouse Air Brake Co., Wilmerding, Pa. Recommended by H. E. Chilcoat.

Hornbeck, W. E., Foreman, P. R. R. Co., Sylvan Ave., Verona, Pa. Recommended by Joseph Slutzker.

Keagy, C. O., Assistant General Foreman, P. R. R. Co., Pitcairn, Pa. Recommended by J. F. Courson.

Kunis, L. R., Agent and Yard Master, B. & O. R. R., Elwood City, Pa. Recommended by J. A. Spielmann.

Landymore, John T., General Yard Master, P. & L. E. R. R. Co., P. O. 111, Dickerson Run, Pa. Recommended by Samuel Lynn.

Lewis, Claude W., Car Agent, Universal Portland Cement Co., Universal, Pa. Recommended by R. S. Wilson.

Lindahl, A. M., Yard Master, Union R. R. Co., Box 151, Linhart, Pa. Recommended by A. E. Stonick.

Lloyd, D. W., Assistant to Director of Engineering, Westinghouse Air Brake Co., Wilmerding, Pa. Recommended by H. E. Chilcoat.

Long, J. Frank, C. C., Penna. R. R., 912 Howard Ave., Monongahela City, Pa. Recommended by C. B. Gray.

Long, J. H., Foreman Car Repairs, Penna. R. R., 144 Main St., Monongahela City, Pa. Recommended by C. B. Gray.

Meeker, Harry B., Foreman Electricians, Penna. R. R., Verona Shops, 441 Parker St., Verona, Pa. Recommended by Joseph Slutzker.

Menham, J. P., Yard Clerk, Union R. R. Co., 302 Larimer Ave., Turtle Creek, Pa. Recommended by A. E. Stonick.

Miller, John, Foreman, B. & O. R. R. Co., Glenwood, Pittsburgh, Pa. Recommended by F. H. Stark.

McConahey, S. C., Treasurer, W. A. B. Co., Wilmerding, Pa. Recommended by H. E. Chilcoat.

McKeag, Jr., Chas. S., Clerk, Union R. R. Co., 1402 Hill Ave., Wilkinsburg, Pa. Recommended by A. E. Stonick.

Nicodemus, Earle H., Division S. K., Penna. R. R. Co., Pitcairn Car Shops, Pitcairn, Pa. Recomemnded by J. F. Courson.

Otterman, C. H., Clerk, Union R. R., 7058 Monticello St., Wilkinsburg, Pa. Recommended by A. E. Stonick.

Padfield, Archie, Chief Draftsman, P. R. R. Co., 538 Penn St., Verona, Pa. Recommended by Joseph Slutzker.

Panos, Chas., Wreck Train Foreman, P. R. R. Co., 431 Jackson St., Monongahela City, Pa. Recommended by C. B. Gray.

Pokorney, J. J., Salesman, U. S. Rubber Co., 133 Seventh St., Pittsburgh, Pa. Recommended by D. J. Redding.

Reed, M. R., M. M., P. R. R. Co., Western Lines, Allegheny Shop, Pittsburgh, Pa. Recommended by A. Stucki.

Rhoads, G. A., Assistant M. M., P. C. C. & St. L. R. R., 2839 Chartiers Ave., Pittsburgh, Pa. Recommended by J. Brock.

Rowley, Charles E., Copywriter, W. A. B. Co., 6362 Aurrlia St., Pittsburgh, Pa. Recommended by H. E. Chilcoat.

Ruhling, J. V., Locomotive Engineman, B. & L. E. R. R. Co., P. O. Box 86, North Bessemer, Pa. Recommended by V. F. Oburg.

Rush, Benj. H., Mat'l. Supervisor, B. & O. R. R., 220 Glenwood Ave., Pittsburgh, Pa. Recommended by J. A. Spielmann.

Seibel, Edward L., Foreman Car Inspectors, P. R. R., 221 Seventeenth Ave., Homestead, Pa. Recommended by C. B. Gray.

Stehl, Jr., E., Local Auditor, Universal Portland Cement Co., Universal, Pa. Recommended by R. S. Wilson.

Straub, Wm. C., Representative, Chicago Pneumatic Tool Co., 10-12 Wood St., Pittsburgh, Pa. Recommended by J. A. Spielmann.

White, Chas. C., Assistant Foreman, P. R. R. Co., Pitcairn, Pa. Recommended by J. F. Courson.

PRESIDENT: As soon as these applications have been approved by the Executive Committee the gentlemen will become members without further action than the payment of one year's dues.

The Nominating Committee presented the names of the following gentlemen as officers for the year 1919-1920 to be voted for by ballot:

PRESIDENT

Col. H. H. Maxfield, Works Manager, Pennsylvania Railroad, Altoona, Pa.

FIRST VICE-PRESIDENT

Mr. Frank J. Lanahan, President, Fort Pitt Malleable Iron Co., Pittsburgh, Pa.

SECOND VICE-PRESIDENT

Mr. S. Lynn, M. C. B., P. & L. E. R. R. Co., MceKes Rocks, Pa.

SECRETARY

Mr. J. D. Conway, 515 Grandview Avenue, Pittsburgh, Pa.

TREASURER

Mr. F. H. Stark, Superintendent Freight Car Repairs, P. & L. E. R. R. Co., Pittsburgh, Pa.

EXECUTIVE COMMITTEE

Mr. L. H. Turner, SMP., Pittsburgh & Lake Erie R. R. Co., Chairman.

Mr. D. J. Redding, Assistant SMP., Pittsburgh & Lake Erie R. R. Co.

Mr. F. R. McFeatters, General Supt., Union R. R. Co.
Mr. A. G. Mitchell, Supt. West Jersey & Seashore R. R.
Mr. F. M. McNulty, Supt. M. P., Monongahela Conn. R. R.
Mr. J. G. Code.
Mr. D. M. Howe, Railway Supplies.
Mr. J. A. Spielmann, Assistant to General Supt., B. & O. R. R.

FINANCE COMMITTEE

Mr. E. C. Sattley, General Manager, Page Steel & Wire Co., Chairman.
Mr. Chas. A. Lindstrom, Assistant to President, Pressed Steel Car Co.
Mr. E. J. Searles, Schaefer Equipment Co.
Mr. George W. Wildin, General Manager, Westinghouse Air Brake Co.
Mr. J. F. Townsend, Traffic Manager, National Tube Co.

MEMBERSHIP COMMITTEE

Mr. A. Stucki, Engineer, Chairman.
Mr. C. O. Dambach, General Manager, Unity Railways.
Mr. H. E. Chilcoat, Manager, Clark Car Co.
Mr. J. A. Ralston, Mechanical Engineer, Union R. R.
Mr. M. R. Reed, Master Mechanic, Pennsylvania Lines West.
Mr. J. L. Cunningham, SMP., Pennsylvania R. R.
Mr. W. C. Burel, Master Mechanic, B. & O. R. R.

ENTERTAINMENT COMMITTEE

Mr. D. H. Amsbary, District Mgr., Dearborn Chemical Co., Chairman.
Mr. Harry Murdoch, President, H. Murdoch Company.
Mr. Henry Gilg, Sales Manager, Penn Iron & Steel Co.

PRESIDENT: It should of course be understood that this does not bar any member of the right to make further nominations.

The Secretary will have ballots printed and mailed to each member with full directions as to returning your votes. The ballots will be counted, in accordance with the provisions of the By-Laws, and announcement of the result of the election will be made at the October meeting, which is the Annual Meeting and at which an entertainment will be given as has been our custom in recent years.

If there is no further business, the next in order will be a series of moving pictures by the Clark Car Company, in connection with a paper on "The Economic Disposal of Waste Material." The paper will be presented by Major Howard L. Beach of the Clark Car Co. I am very happy to have the privilege of presenting to you Major Beach.

THE ECONOMIC DISPOSAL OF WASTE MATERIAL.

By Major Howard L. Beach, Clark Car Co., Pittsburgh, Pa.

The question of waste material disposal is one that has been more or less under discussion for many years. Only in recent years, however, has it become so acute as to demand special consideration. Among the causes which have contributed to make this a matter of ever increasing importance may be mentioned:

1. Waste material, particularly slag, ashes, etc., is no longer as much in demand by railroads for new construction.
2. Lowlands adjacent to waste material producing industries have been filled up or otherwise utilized, making longer hauls necessary.
3. Increasing shortage of labor.
4. Periodical shortages of cars.

Due to these conditions, the wasting of this material has become a burden keenly felt by the railroads, and in addition is a source of actual loss in revenue to them, as will be shown later.

In handling revenue producing commodities there arise costs of various natures; there are loading costs; haulage costs; switching costs, and lastly there are unloading costs. The reduction of these costs has been given careful attention, as evidenced by the many labor-saving devices employed for handling such commodities. Heavy demurrage charges are also placed on the holding of cars, and have contributed in no small degree toward the installation of facilities for promptly unloading and releasing cars at their destination.

In the coal industry expensive tipples have been erected so that cars may run from the mine to chutes and dump directly into the cars without labor. Special cars have been produced for mine service so that no labor will be required to get the coal out of them. The coal is even graded mechanically.

Haulage costs have been reduced by designing special cars for coal service and each year sees larger and more efficient cars in use. Locomotive design has been given great attention to get haulage units of the largest practical size to increase the tonnage of trains and reduce the labor required to haul the coal.

At the consignee's end of the line money has been spent lavishly to provide trestles and chutes allowing cars to discharge the coal directly into hoppers with a minimum of labor. This might be expected at such places as our great ports but it has even been carried out in small towns where the coal dealer builds a timber trestle and then buys auto trucks with special dumping bodies that will spill the coal down a sidewalk manhole and save the man with the shovel.

In the ore trade, large powerful devices have been made for taking ore out of vessels and placing it directly in railroad equipment without the use of the shovel. This labor-saving work does not start here, but back at the mine where great attention has been given the design of steam-shovels for loading, and cars that will bring the ore from the mine to the lake front and load right into steamers with only such labor as is required to trip latches on the cars and open doors from the ore bins allowing the contents to run into the boats.

After mechanically unloading from the boats into cars the ore is transported to the furnaces. Is it shovelled out of the cars there? Not by any means. The steel mills spend a quarter of a million or so for a ponderous machine that will pick up a car bodily and dump it over spilling the contents either into specially designed transfer cars which deliver direct to the skip hoists feeding the furnaces or to the ore bridges which place the ore on the stock piles.

The commercial development of the large armored electro magnet has been eagerly taken up by consignor and consignee alike as a labor saver, and you see on all sides locomotive cranes loading and unloading cars of pig iron, scrap and even rails and structural shapes. The locomotive crane in itself has become indispensable as a loading and unloading device.

Material is called waste depending on its origin and its use. In some places rock is obtained for various building purposes or for roads or, in the case of certain lime stones, for use in blast furnaces. As such it is certainly not called waste and is handled with all the care in the selection of equipment that is given coal or ore. If, however, this rock is in the way of other things such as iron or copper ore or coal it is called waste and generally maligned and mistreated. It is loaded into the same class of cars that would be used were it going to a car dumper for use in the blast furnaces, but instead of going to such a place it goes to some out of the way hollow and is thrown over the bank. No car dumper is available, no locomotive crane handy, so a lot of labor is transported at large maintenance expense and the rock mauled out of the cars as best it can be. Instance after instance can be cited of this operation repeated daily all over the land not always with rock, but with everything imaginable including tin cans, ashes, filth, and slag in its various forms ranging from granulated to skulls.

That efficient equipment is available for this work is evidenced by the contractors equipment so often seen where railway construction is going on. Probably the largest contractor's job in modern times occurred when Uncle Sam dug the Panama canal. Certainly no better opportunity was ever presented to the car builders to furnish efficient devices for wasting material with a low labor charge. There one saw the long train of flat cars with one low side, a powerful haulage engine attached to one end of the train and connected to a plow at the other scraping the waste material off the cars one at a time.

This material fell near the track and was then cleared by a spreader car which pushed it off and left a flat shoulder for the next train load. One could also see what was the forerunner of the modern dump car doing good effective work. Uncle Sam bought every device he could find that would save labor, for labor in Panama was probably less efficient than labor anywhere. Some of these dump cars were so well made that they are doing service today.

The modern railroad contractor has followed Uncle Sam's example almost universally. He gets his pay for handling this material and to him it is pay freight. He makes his profits between what he gets per cubic yard for handling the material and what it costs him per cubic yard. The costs are not swallowed up in other numerous operating costs, but stare him continually in the face and he knows to a penny what equipment will do the work most efficiently.

The principal consideration in locating steel plants was the proximity of ore, coal, coke and limestone. The same degree of importance had not then been attached to the disposal of waste. Today the waste problem is an important factor, for it is no longer needed for railroad construction, and during congested periods interferes with the movement of other commodities, resulting in frequent embargoes against this class of material. During the past winter certain plants had to shut down when the railroads were unable to take the refuse away.

Most of the steel plants and some of the railroads have come to see that the answer to the waste problem is not to raise the rates for its disposal, but to reduce the cost. Since labor for unloading is the largest single item of cost, attention is being turned in this direction with the result that in a number of places special equipment is being considered and in some places is already in operation.

The Lehigh Coal & Navigation Company was one of the first to recognize the value of efficient dumping equipment, and in order to get the best results, changed several miles of narrow gauge track to standard gauge, built a couple of railroad bridges, purchased standard gauge locomotives, and lowered the grade of their tracks several feet so they could use the largest dump cars obtainable to dispose of the rock waste from hard coal mines without labor on the rock dump. They have since the first installation bought several installments of equipment of a similar nature for other mines.

The quantity of rock handled in this instance is so large as to be almost unbelievable. The mines feeding three breaker and washer plants waste between 10,000 and 12,000 tons every day. This rock is entirely too large to handle in hopper cars pieces often being several feet across in any dimension chosen for measurement, and quite comparable to large slag sculls from open hearth furnaces. At one operation they have three rock trains working. Each train consists of a locomotive and two cars, and each train makes between twenty-five and thirty trips every day. The cars carry fifty tons of rock each which means that between 7,500 and 9,000 tons of rock are dumped every day. Can any one form a picture of a standard railroad car such as a gondola or hopper being dumped twenty five times a day? The entire labor force for this work consists of two men on each train, a foreman and nine laborers keeping the track in shape on the dump, and a couple of men on the loading chutes. Figuring $4.00 per day per man, or $72.00 for the lot, the labor cost on 7,500 tons dumped is less than one cent per ton.

The Central Steel Company purchased one dump car for disposing of their open hearth slag and found that they had a direct labor-saving equal to the cost of the car every 100 days. This is possibly exceptional as the haul was measured in yards and they dump the car several times a day using a shifting locomotive that would otherwise have been partially idle waiting for in got cars to be loaded or unloaded.

The Baldwin Locomotive Works at its Eddystone plant put six dump cars into service removing a large clay bank in the middle of their plant. They increased the rate of removal from 250 cubic yards a day to 400 and reduced their direct cost from 90 cents per cubic yard paid to a contractor to 16 cents paid in renting a small steam-shovel, and directly against their cost of a locomotive and crew.

In the spring of 1918 the Ordnance Department, United States Army, desired to raise the level of Neville Island for the purpose of building a large munition plant. The work was carried on under the direction of the United States Steel Corporation, Ordnance Department. The material for the fill was waste from the steel plants, largely granulated slag. Some 60 car loads were delivered daily to the island in hoppers and gondolas. That meant that it was necessary to unload all this material each day. Within about two days every track in sight was filled with cars of slag awaiting disposal.

The usual gang required to unload a hopper is six men, and they can unload an average of two cars a day. To unload 60 hoppers, therefore, not only required 180 men, but a dump track long enough to accommodate 30 cars at one time. Since track must be shifted occasionally, it is readily seen that to keep the operation moving all the time about 250 laborers were required, and the face of the dump must be at least one-half mile long, or longer than the width of the island. The officials found it impossible to make any headway at all under those conditions and therefore looked elsewhere for relief.

Twenty dump cars were purchased and operated in two trains. The hoppers were run through the steel plant car dumper and discharged into the dump cars. This was found not to be entirely satisfactory, and a wooden trestle was built containing bins beneath the track. The hoppers were to be dumped in the manner for which they were designed, i. e., into the bins. The dump cars would run on a lower grade level and load directly from the bins. This was just completed at the time of signing the armistice.

With the car dumper, however, a train of dump cars would run to the dump and return in about 40 minutes. One train was being loaded while the other was going out and returning. With this arrangement the work was carried on as fast as labor could advance the tracks on the edge of the fill being made. Remember this was not a proposition of cost, but a proposition of getting the work done, and done as soon as possible.

Instances like these can be picked up and given one after another, but mean little until the whole problem is drawn together. In the Pittsburgh district, including Wheeling and New Castle, there originates each day 600 to 700 car loads of waste material. Ninety percent of it is loaded into gondolas and hoppers. The average time in good weather from delivery of the car under load to the railroads, to returning it empty to the railroads for other use is five days. There are 2,000 to 2,500 cars tied up all the time in just disposing of waste material. Just think of it—2,500 cars; enough to reach from Pittsburgh to Sewickley, if made up in one train, and capable

All Cars Dumping Simultaneously

of handling 100,000 tons of freight figuring 40 tons average load to the car.

The average time, under favorable conditions, that a car is on the dump being unloaded or waiting while its neighbor is being unloaded is two days. The railroads, therefore, consume at least three days in their movement, and if they would only install a "slag special" or two running direct from the larger waste material producing industries to their dump and return, they could reduce the number of cars in this service by one half.

It costs the railroads 75 cents a ton to handle this material with their present equipment. They receive 25 cents a ton for granulated slag and ashes, and 44 cents for heavier material such as brickbats and open hearth slag. They are, therefore, working at a direct loss of from 31 to 50 cents a ton, or an average of 41 cents a ton. This runs into the large amount of $11,480 a day averaging 40 tons per car. In addition to this an enormous quantity of equipment is tied up and kept out of regular freight service. In the winter of 1917, 1918, there were as many as 9,000 cars in this district under waste material load, and the average time the car was in this service was from nine to ten days. To be sure this was a war time condition, but unfortunately occurred when cars were almost worth their weight in gold for hauling urgently needed war materials. A recurrence of this condition in active peace times is easily probable.

Mr. Hines has just issued a public statement showing that the railroad administration is keenly alive to a probable car shortage this coming winter. This statement shows that some 900 new cars are being completed and put into service every day, and he has authorized the car builders and repair shops to increase the weekly hours of labor from 48 to 54, and to employ double shifts wherever men can be obtained in sufficient number to warrant such a course.

Strange to say while the administration has a known daily loss of $11,000 in this district alone, for the handling of one general class of material, not one car of all the thousands being put into service is specially selected or designed to decrease this loss. They are all of standard make and standard

Dumping Open Hearth Slag To Fill

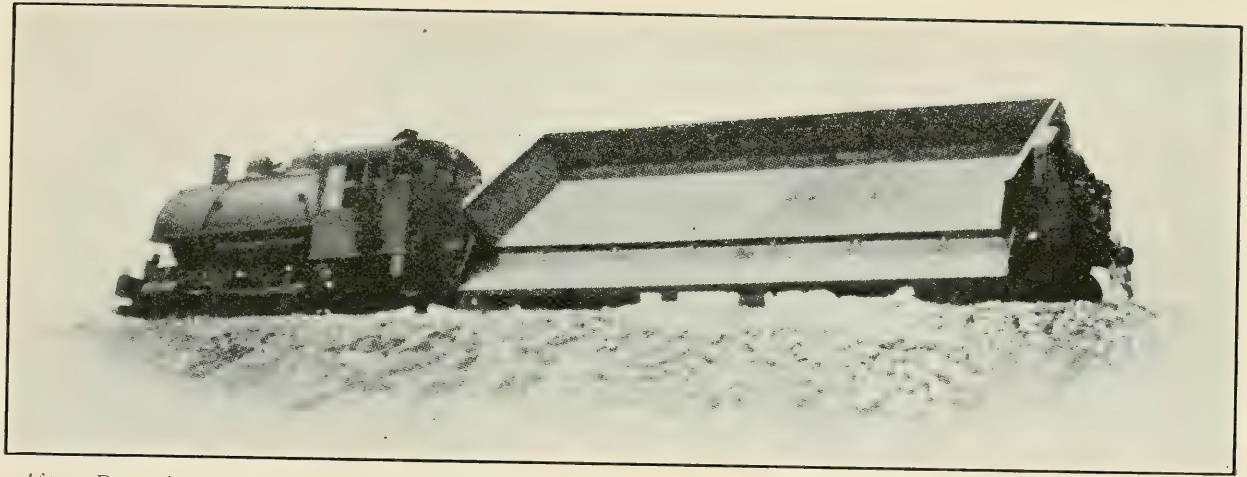
size, selected after years of experience to fit other classified service.

A thousand dump cars handled on a scheduled cycle would care for all the waste in the Pittsburgh district, as it is produced today, and not only release from 2,500 to 9,000 gondolas and hoppers, but eliminate all the labor now employed on the waste dumps for cleaning the cars, leaving only a small gang to shift and level the track as required.

That such a service is practical is readily illustrated by reference to classified freight service in many other lines. Refrigerator cars are used for perishable goods only, except in rare cases of extreme car shortages. Box cars are made to accommodate certain classes of material as instanced by automobile cars and grain cars. A grain car is never loaded with coal, but is kept clean for its intended commodity.

Cycles of operation for movement of freight are planned and carried out with the regularity of passenger service. Take the ore trains from the lakes to the valley furnaces—the cars are selected for the service, and are even returned empty to the lakes, so as to keep the cycle moving on schedule. It is, of course, desirable to have loads in cars whenever moved, and that argument is often put forth in regard to the movement of waste material, i. e., that cars come to the plants loaded with ore, coal and limestone, and they should be shipped out loaded. That is all very well from the standpoint of the plant, but go a step farther—if they are never to be moved without a load, what shall be put in them on the waste dumps? The haul to a waste dump seldom exceeds 30 miles. If it is economical to haul empty cars 75 miles from the Valley furnaces to the lakes, just to maintain a scheduled cycle of operation, how much more economical it should be to haul empty cars 30 miles from a waste dump to the mills. As a matter of fact this is actually done for the cars from the waste dump must go somewhere for a load. They usually go to a big distribution yard where they are shunted around for a day or so and then head in to a coal mine, sand bank, or quarry for a load.

With the short haul obtainable for waste material disposal there should be no excuse for waste cars going into distribu-



After Dumping Open Hearth Slag To Fill. Note Total Absence of Back Fill tion yards at all. The "Slag Special" can gather, as it goes out, move to the dump, and spot directly on its return trip, thus saving time in every movement. The engine does not even become uncoupled from the train on the dump, but brings the cars it takes out, back whence they came.

The direct loss in operating expenses to the railroads of $11,000 a day amounts to a grand total of about $4,000,000 a year. This amount would buy enough efficient dump cars to take care of the entire waste product of the district. The argument that these cars could not be kept in this service is very weak, to say the least, for other classified service cars are being maintained in classified scheduled service all the time.

The illustrations following show a few of the present methods employed in wasting material. The "labor" method is not new, and may be seen most anywhere. We will now have the lights turned off and give the picture man a chance.

Our first picture shows a gang of laborers shovelling dirt from a string of gondolas. You will note there are some nine men on each car.

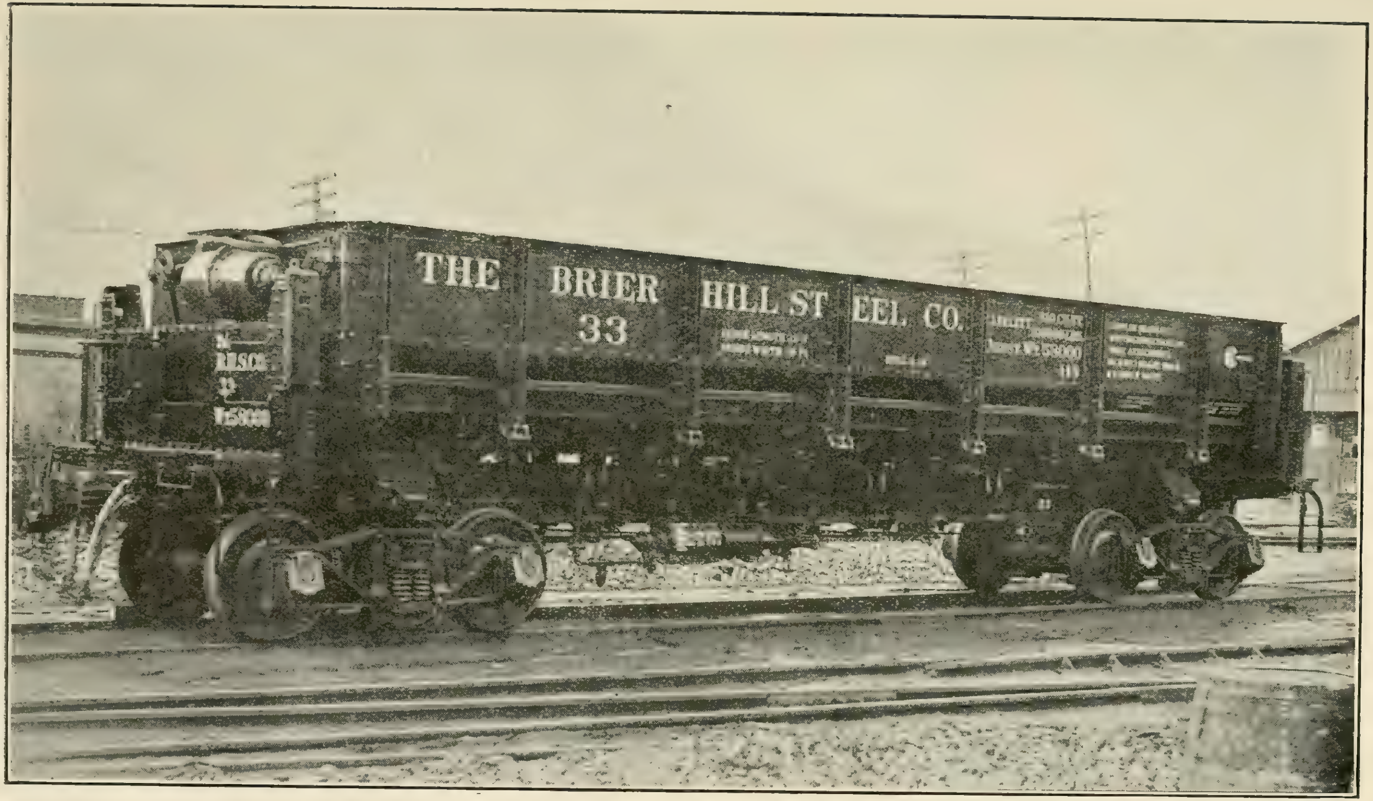
The next picture shows hopper cars being unloaded to make a slag fill for a railroad grade raising, and yard extension improvement. Slag does not run readily out of hoppers, and in addition to hauling it from beneath the car, men climb around the sides and poke the material down through the hopper openings.

We next show a regularly appointed waste material dump. The cars have,

"Men to the front of them
Men to the side of them
Men on the top of them
Long suffering waste cars."

This view shows a special type of car built for handling ore from the mines on the iron ranges to vessels at ports. There are several points of interest about this car which will bear mentioning.

When the ore docks on the lakes were first built, the bins or pockets were made 12 feet long. The cars were made 24


THE BRIER HILL STEEL CO.
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B.H.S.CO.
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feet long, so that a train spotted above will place a car over every other bin. This has been adopted as a standard car length, and all ore cars are made to this dimension. Ore is frequently in a wet, sticky condition, and will not run easily. This presented another problem to the car builder, and was solved by giving the floor plates of the car a high slope angle. Coal cars seldom have greater than a 30 degree slope on the end floors whereas ore cars run up as high as 55 degrees. The hopper opening was made horizontal too, and very large, and the inside sheets of the car coming in contact with the ore are sloped so that the angle to the horizontal is constantly increasing. This tends to make the ore run faster as it approaches the hopper opening, and get out of the way of the rest of the load. The car is known as a self-cleaning car and by that is meant that all of the load will run out when the hopper doors are opened. No labor is needed to poke the ore down through the hopper. Several types of doors have been produced for this type of car. Some are hinged along the edge and held in place by chains wound on small manually operated hoists. In this type a dog is knocked out of a sprocket wheel allowing the chains to unwind and drop the doors. The car shown in the picture has the doors supported on links near their horizontal axis. They are locked together with one central latch. When the latch is released the doors are pushed out sideways by the load and after the car is empty, will come back part ways by gravity. A slight push by a man will close and latch them. A test of this car, under most favorable conditions, has shown that it is possible to dump 50 tons of ore and close and lock the doors again in seven seconds, one man doing the entire tripping and closing operation.

Our next picture shows a special car designed for conveying flue dust from stock piles to a sintering plant. In this service, capacity, quickness of dumping and side delivery of the load were of prime importance. That the car is large is readily apparent. The doors are balanced like those in the ore car just shown, and are worked from the ends of the car through a long shaft with crank and link connection to the door trunnions. This car is easily operated by one man.

These last two illustrations are for the purpose of showing to what extent the trade has gone in the production of special cars for the handling of pay freight. For waste material work discharging over a fill, the tilting side dump car has proved to be the best type for the service. There are several different designs on the market, all good and all capable of giving efficient account of themselves in this service. The only type the writer can show on the screen, however, is manufactured by the same concern that made the types just shown.

This car, as will be seen, looks like a gondola. The floor height, however, is higher than that of a standard gondola, since it must turn over and still clear the trucks. The sides of the car are hinged along the lower edge and turn down as the body rolls over. In open position the car looks like this.

The next few pictures show the car in operation as well as a hand camera will illustrate such work.

The first of these pictures shows a car load of open hearth slag ready for dumping at the Railway Steel Spring Co.'s plant at Latrobe.

The next shows it as it goes.

Here we see the empty car. It takes less time to do it than to tell about it.

Next is shown the clay bank at The Baldwin Locomotive Plant at Eddystone, Pa. The loading is all done mechanically with a steam shovel. Now the train arrives at the dump. Watch the man near the end of the train. He goes to the end, turns a little valve and we now see the load going out. Every car moves with its neighbor.

The next picture shows the train after dumping. The last car was on track very near the edge and all the load went out. The rest were on track quite far back from the edge, and the second and fourth cars from the rear end were actually dumping to level ground.

The last of the still pictures shows this same train being pulled away from the load. Note that even though the cars dumped to level ground the track is completely unobstructed.

It is not difficult to get views such as these, but they hardly give as complete an impression of the smoothness of operation as one gets from seeing the cars actually operate. To bring this to you we have tried to get moving pictures of trains and single cars working, and have been successful only in a partial degree.

PRESIDENT: The paper is now open for general discussion.

A MEMBER: What is the capacity and what is the cost of these cars?

MAJOR BEACH: Thirty yards capacity, forty to forty-five yards peak load. Fifty tons. The cost at present is about $5,000.

PRESIDENT: There are people here who have had experience in handling this refuse material and they have had their difficulties, and we would like to hear about them. They also handled it during that hard season winter before last and I have my doubts whether this car could have handled that stuff during that weather. What do you do with cars that freeze up?

MAJOR BEACH: Isn't a large amount of the freezing due to the fact that the cars stand under load for relatively long periods for want of labor to unload them? The unloading would of course be speeded up with air dump cars and minimize the trouble from freezing.

PRESIDENT: But if you have to transport it fifty miles, you can not turn your road over to these special trains.

MAJOR BEACH: It should not be necessary to give the road over to the special slag trains. A train of cars runs on a schedule and the road is given over to that train of cars on that schedule. That is true of all trains. Trains of slag cars may be handled in the same manner.

Granulated slag would be the worst stuff to freeze up, but it comes into the cars hot and by the time it gets to the dump it is cool but not enough to freeze. Other material, like rock, would not freeze up. The cars were in use at the steel plants I spoke of all through the winter. Lots of that material comes out of the pit dripping wet, still they worked right through the winter. The Utah Copper Co. uses the cars on their overburden in the mountains near Salt Lake City and it is cold there. They dump rock in the winter time just the same as in the summer.

MR. C. O. DAMBACH: I would like to ask whether you have any trouble with the car going off the track.

MAJOR BEACH: We have never had a car go off the track dumping. It may go off the track, but not where any other car would not go off. It will go around a 90° radius curve. It is designed just like a standard railway car, center sill underframe, etc.

MR. C. O. DAMBACH: I understood you to say they charged up $25 a day as the cost of the engine and crew? That is very much less than the actual charge today on any road so far as my knowledge goes.

MAJOR BEACH: That is what a Baldwin Locomotive Works man told me they figured a locomotive at in their yard service.

MR. DAMBACH: The wages of the crew alone would run pretty close to that.

MAJOR BEACH: I am just giving you the figures that were given me by the Baldwin people. You ask another question about the speed of dumping. I was told by a Maintenance of Way engineer the other day, that they have two cars in service with a railroad ditcher and found it a distinct advantage to dump the dirt while running at a speed of approximately fifteen miles an hour, thus scattering the dirt in such a manner as to need no further attention. That method of dumping speaks well for the stability of the car.

PRESIDENT: I understood you to say that during the cold weather winter before last there were plants in the Pittsburgh District closed down on account of the railroads not removing waste material. Can you name the plants?

MAJOR BEACH: I can not, off hand. But we sent out some inquiries relative to the disposal of waste material at the time and the answers that came back from those people were that they had been shut down. They were small plants delivering perhaps a carload of that material a day and they had to shut down when they could not get the waste taken away. Some of them had to put in automobile trucks to take care of it.

PRESIDENT: I think that ought to be made clear, because there were small plants compelled to do it to save cars. They made them do it because they could do it. I would say there was no plant in the Pittsburgh district closed down on account of the railroads not taking away their waste material. I believe an analysis of the situation will not bear the statement that plants closed down for that reason.

MAJOR BEACH: I simply had that from information obtained from answers that came back to inquiries which we sent out to different plants.

I know Mr. Spielmann is quite interested in this waste material because he took me out and showed me where they were getting rid of some tin cans for the city.

MR. JOHN S. LENT: Have your investigations gone far enough to get to the point of estimating what the railroads in this territory could handle waste material for under these conditions set forth by the dumping cars? There has been more or less dispute between the furnace people and the railroads in this territory as to what the cost is. As I understood the speaker, he said that under ideal conditions at a given plant it was performed at something less than 1 cent a ton.

MAJOR BEACH: That was the labor charge, the labor charge was something less than 1 cent a ton. That was a short haul with a machine load and a condition where they had a high dump, so that a few men in the track gang could keep the track in shape.

MR. LENT: Could you say approximately what the cost would be, considering overhead expense and the handling of the train, etc.?

MAJOR BEACH: I can not. I have not gone into it deeply enough for that, I have looked more at the labor-saving end of it.

PRESIDENT: I understood your cost data there as mentioned was simply unloading cost?

MAJOR BEACH: Yes sir, simply unloading cost.

PRESIDENT: It did not include transportation cost nor cost for land nor cost for shifting of the track, nothing of that kind whatever?

MAJOR BEACH: Nothing but the adjusting of the track and the dumping of the material.

PRESIDENT: If the railroads had that apparatus it would certainly decrease the cost of unloading in the summer time. But there is a great deal of this material that does not come to the railroads direct but comes through switching lines and industrial roads and it is sometimes held on these roads before it gets to the interchange track. There are delays of that kind where it would freeze up before the railroad would get it.

MAJOR BEACH: That is the point I was trying to raise in suggesting a slag special, where arrangements must be made to deliver the slag from the plant to your special as it comes in.

MR. LENT: Isn't the matter of finding some place to dispose of this material a big problem?

MAJOR BEACH: That is a pretty big problem around Pittsburgh.

MR. LENT: There are some roads that have to haul 150 to 175 miles before they come to a dump.

MAJOR BEACH: Isn't the long haulage in that case due to the kind of material in the car?

MR. LENT: No, it is a place to put it.

MAJOR BEACH: Not so much a place to put it as a place they can put it. I believe slag from the Pittsburgh district seldom goes more than twenty or thirty miles.

PRESIDENT: I think that differs on different roads. Take our road, it is not built across the mountains from one hill to another. The Pennsylvania goes across ridges and valleys; we go up a valley. It depends a great deal upon the character of the country and how they cross it. Around Pittsburgh, so far as we are concerned, we have to buy land to dump this on. Other roads may have large holes that they can fill.

Getting off the slag question, we have quite a number of these air dump cars in ditcher service along with the American ditcher and they are very convenient cars to use in that service. They load these cars from the main track with the ditcher and haul them out to a fill and dump them, saving hand unloading, which is a big saving. And the same could apply to this waste material if the companies had the money to get the equipment and it could be arranged so they had the land and places to dump it, I would say, in the summer time. I do not know how that would work out in the winter time. I know it freezes up 6 or 8 inches deep on the sides and ends, sometimes solid, and I would think you would have the same difficulty in that line which we now have with other cars.

MR. A. E. ANDERSON: What is the life of these cars?

MAJOR BEACH: So far as the life of the car is concerned I do not know that anybody has found that out yet. We have had them in service a number of years and as far as I know none of them has gone to the scrap heap yet.

MR. H. E. CHILCOAT: The average life of these cars might be compared with the standard hopper car or any steel car. It is an all-steel car and aside from the additional dumping mechanism is subject to no more wear and tear than the average steel car except that it is loaded and dumped much more frequently, and to that extent has possibly more wear and tear. I remember several years ago there was a discussion before this Club upon the life of steel cars and the concensus of opinion was that it depended very largely upon the standard of maintenance. The same thing would hold true with the dump car.

MR. CLARK: I want to say a little about that freezing. The air dump car has no more difficulty from freezing, on account of the air dump, than without the air dump.

A MEMBER: It is not the dumping mechanism, it is the material in the car. They have to haul it long distances simply because they have no place else to dump it. But there is an advantage in hauling this material in coal hoppers, in that they can be unloaded and placed at once into coal tipples and loaded with coal, avoiding empty haul.

MR. CLARK: The material would undoubtedly freeze if allowed to stand long enough in cold weather. Even under these conditions, however, a frozen load can be removed from one of these cars with greater ease than would be possible with a frozen load in a hopper or gondola car.

PRESIDENT: There is of course an advantage in hauling slag in coal hopper cars to points in the vicinity of the mines where it can be dumped, without taking the cars back to an assembly yard, but putting them right into the mines. You could not do that with these dump cars, could you?

MAJOR BEACH: You could get them in to the mines and load them with coal to save the haul back.

PRESIDENT: What is the capacity of the cars?

MAJOR BEACH: 60,000 pounds of coal.

PRESIDENT: How many will it take to handle the business if we put them in promiscuously with the other cars?

MAJOR BEACH: It will take just as many to handle the slag business whether you load them with coal or not. The cars are designed for the waste material business.

PRESIDENT: They would have to be kept in the slag business?

MAJOR BEACH: That is the most economical thing to do. The economy of the dump car comes from dumping it, not from hauling it on the railroads. The dead weight of a dump car is more than that of an ordinary car of the same capacity because it has the dumping mechanism in addition, so that the only excuse of the dump car is to save labor. Therefore its proper use is in the operation in which it saves labor. If you use the car to haul steel or lumber or coal you are not making use of the car for the service for which it was designed. Using it for service for which it is not fitted is just as bad as putting coal into a grain car.

PRESIDENT: He is in pretty close touch with the slag. I think his figures on costs are mighty close and his figures on quantities also are close, evidently he must have been talking to some railroad man.

A MEMBER: The principal objection to the cars is from the furnaces. They will object to the extra equipment coming into their plants.

PRESIDENT: Has any one else any question to ask the speaker? I think we are very fortunate in having this talk and these pictures at this time. This waste material question is an awful burden on the railroads and I am just a little bit surprised that there has not ben a somewhat more lively discussion of it. We are very thankful to the speaker for his kindness in giving the talk and the trouble he took in getting the pictures. The Club is certainly indebted to the Clark Car Company and to Major Beach for this instructive talk and for the pictures.

On Motion a formal vote of thanks was extended Major Beach, and through him to the Clark Car Company.

Is there anything further any member wishes to bring up? If not we will adjourn to the luncheon which has been prepared, and to which you are all invited.

ON MOTION, Adjourned.

J. D. CONWAY, *Secretary.*

Society of Railway Club Secretaries Minutes of Annual Meeting, June 19th and 20th, 1919.

THE SOCIETY OF RAILWAY CLUB SECRETARIES met in annual session Thursday morning, June 19th, 1919, at the Marlborough-Blenheim Hotel, Atlantic City, N. J., the Chairman, Mr. A. J. Merrill, of the Southern & Southwestern Club, Atlanta, Ga., presiding. Other Clubs were represented as follows:

New York Railroad Club—Mr. Harry D. Vought
Central Railway Club—Mr. Harry D. Vought
Canadian Railway Club—Mr. W. A. Booth
The Railway Club of Pittsburgh—Mr. John D. Conway

The Minutes of the last annual meeting in 1916 were read and approved as was also the report of the Secretary-Treasurer, Mr. Vought. The latter made known that there was a comfortable balance in the Treasury in addition to which the Society has a Liberty Bond for $100.00 which investment the Chairman had authorized the Secretary-Treasurer to make while the Society was in recess.

The report further stated that some of the Clubs were in arrears for their annual assessments, the St. Louis Club not having paid for 1915-1916-1917-1918, a total of $60.00; the Southern & Southwestern Club for 1918, $15.00 and the Richmond Club which went out of business when the was was declared, 1917 and 1918—$30.00, the entire amount due the Society thus being $105.00.

Anticipating that the greater part of these arrearages would be made good it was agreed to make no assessment for 1919-1920 and that the assessments of the Richmond Club for obvious reasons be canceled. The Secretary further reported that while the Society was in recess for the war period the Index of Subjects had been annually compiled and copies sent to each member of the Society for publication in the Proceedings of the various Clubs.

The further report was received with gratification that there was some prospect of the Western Railway Club renewing its membership and of the new Pacific Coast Club becoming a member of the Society, correspondence looking to such a result having been conducted by the Chairman and the Secretary with the Secretaries of these two organizations.

Mr. Booth advised that Mr. James Powell, his predecessor, had retired from active railroad service and hence the change in the Secretaryship of the Club. Expressions of regret were made at the loss of Mr. Powell's always pleasant association with felicitations on his having been succeeded by one so affable and congenial as Mr. Booth. The following letter from Mr. Powell was read and ordered incorporated in the Minutes:

Montreal, June 6th, 1919.

Mr. Harry D. Vought,
Secretary, Society of Railway Club Secretaries,
Atlantic City, N. J.

My Dear Harry:

I deeply regret not being able to be with you at the reunion of the Railway Club Secretaries this year, but I have lately resigned my position as Secretary of the Canadian Railway Club having taken up other duties outside of railway work.

Mr. W. A. Booth (who succeeded me as chief draftsman of the Grand Trunk Railway)—the bearer of this letter—has been appointed Secretary of the Canadian Railway Club and will be present at Atlantic City with you; and I commend him to you in all sincerity and heartiness and trust that you and your fellow secretaries will receive him in the same cordial and happy manner as you always received me.

I can assure you that he will fulfill the duties of Secretary of the Canadian Railway Club and as a member of the Society of Railway Club Secretaries in an efficient and satisfactory way.

He is new to the festivities of Atlantic City and I trust that you will make his visit as pleasant as possible and am sure that you will never regret it.

I wish the Society of Railway Club Secretaries all prosperity and would ask you to convey my felicitations to the Father of Railway Club Secretaries—Mr. Daniel M. Brady.

I allow myself to hope that you are enjoying the best of health and with kindest personal regards beg to remain,

Your sincerely,

(Signed) JAMES POWELL.

Following an exchange of experiences and methods in the conduct of the secretarial services of the members, the meeting adjourned until Friday morning the 20th of June.

Upon reconvening at that time there was discussion as to the best time of future annual meetings. It was agreed to meet on the Saturday intervening between the meetings of the Mechanical Section of the American Railway Association formerly the Master Car Builders Association and the American Association of Railway Master Mechanics, the meeting to be preceded on the previous Friday by a Round Table Luncheon, each Secretary to arrange for the attendance as a guest of the Society, of the highest ranking officer of his Club present at the convention.

Adverse action was taken on a reference from the New York Railroad and the Central Railway Clubs as to whether it would be advantageous for railroad clubs to become members of the National Engineering Council organized during the year in Chicago. This was due to the fact that the Clubs have not a large representation of the engineering profession in their membership and the various engineering societies being actively identified with the work contemplated by the promoters of the council the result would be an undesirable duplication of membership for the Clubs to unite with it.

In considering conditions incident for two years to the attitude and policy of the postoffice department with respect to the postal privileges of the Clubs in mailing Official Proceedings, it was agreed to recommend to the Executive Committees that as the Clubs have a combined membership of 8,000 or more, they should unite in petitioning the Postmaster-General to reopen the matter, and give it his personal consideration. It is believed that if this can be accomplished, the question can be presented in a manner calculated to secure more favorable consideration.

There being no further routine or miscellaneous business the officers chosen in 1916 were re-elected as follows and the Society adjourned subject to the call of the Chairman.

Chairman—Mr. A. J. Merrill
Vice-Chairman—Mr. W. E. Cade, Jr.
Secretary-Treasurer—Mr. Harry D. Vought

Respectfully submitted,

HARRY D. VOUGHT,

Secretary-Treasurer.

In Memoriam

T. W. BARRETT
Died, May 8, 1919.

H. H. HILBERRY
Died, August 5, 1919.

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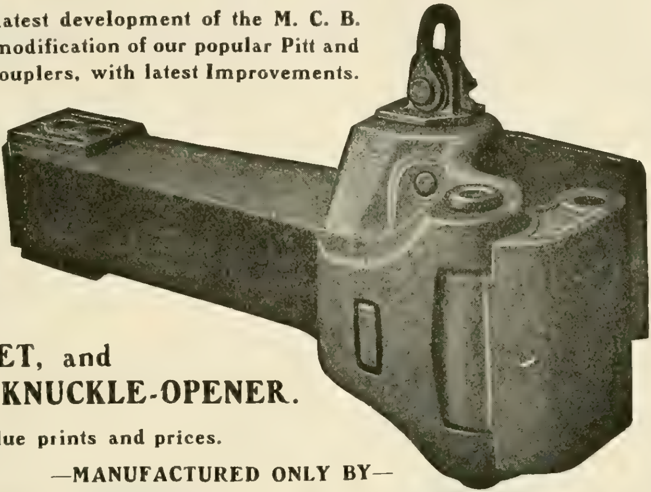

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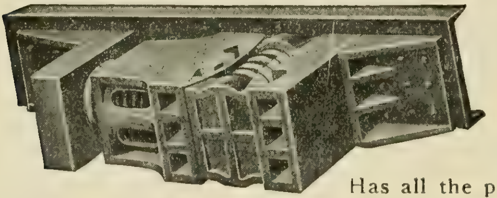

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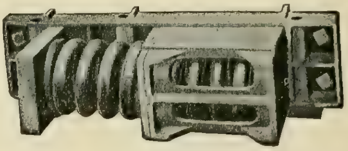

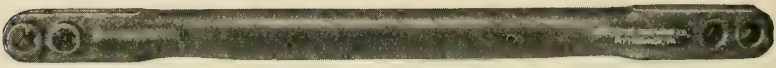

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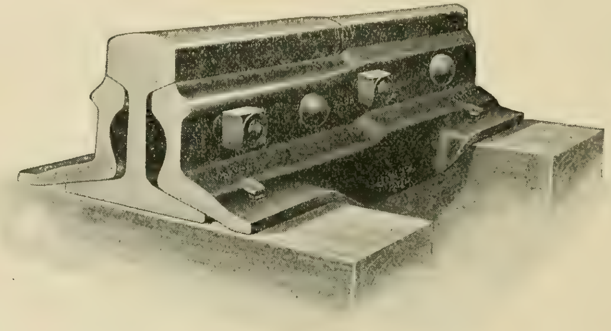

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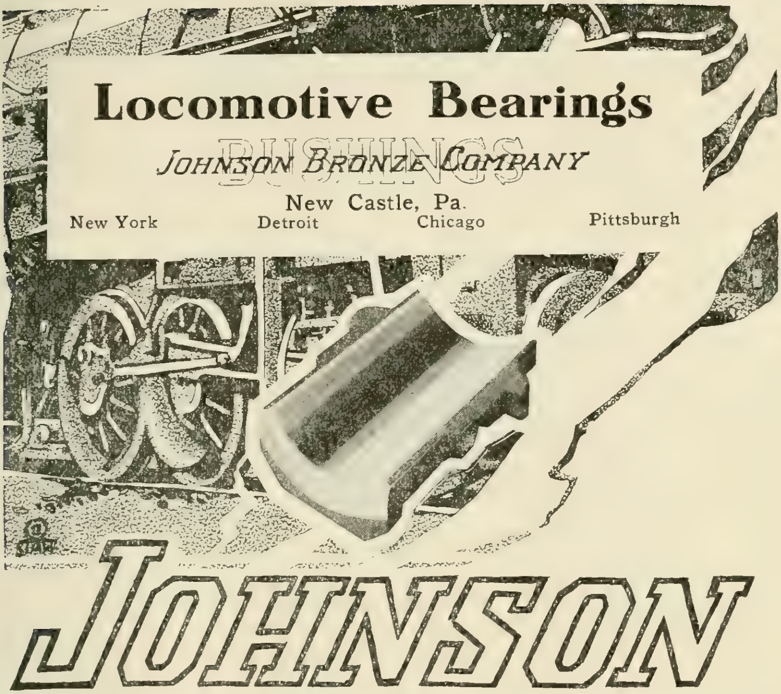

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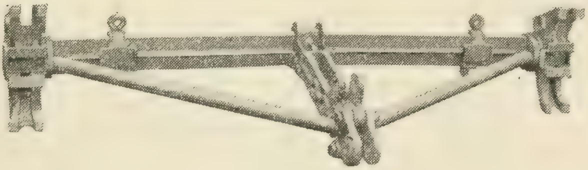

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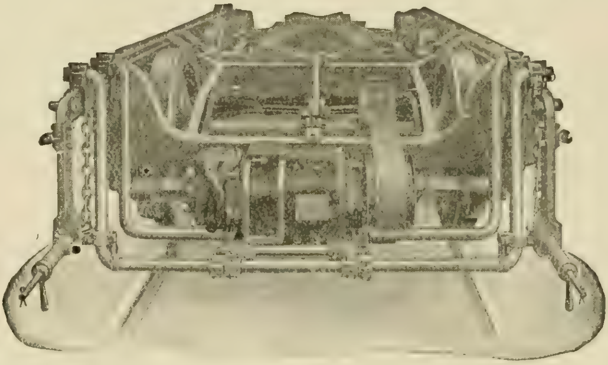

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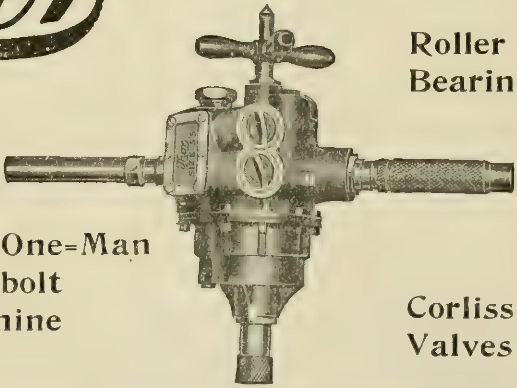

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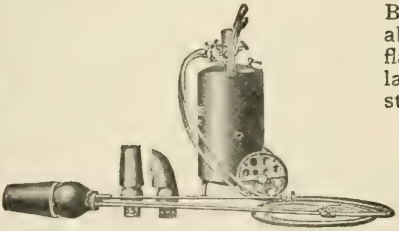

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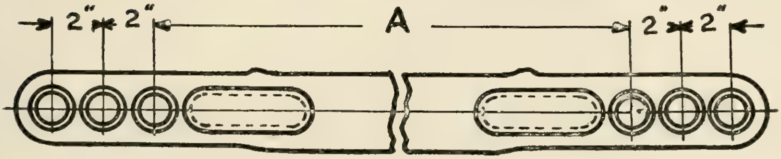

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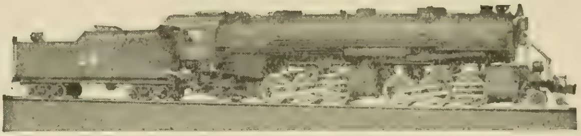

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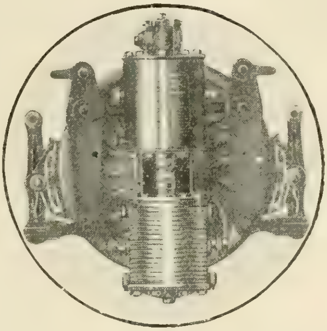

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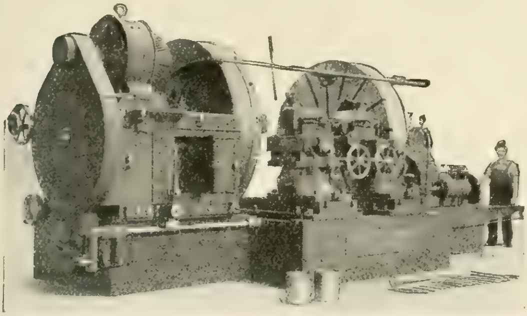

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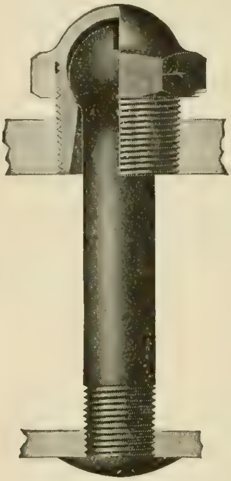

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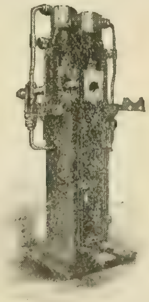

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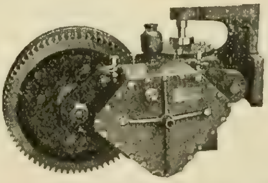

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Johns-Manville Co., H. W.	xix
Johnson Bronze Co.	i
Locomotive Stoker Co.	xv
Locomotive Superheater Co.	Front Cover
Magnus Company	iii
Mahr Manufacturing Co.	iii
Metal & Thermit Corporation	ix
McConway & Torley Company	xv
National Car Wheel Co.	iii
National Malleable Castings Co.	iv
Niles-Bement Pond Co.	ix
Page Steel & Wire Co.	Front Cover
Pressed Steel Car Co.	xx
Reading Specialties Co.	vi
Railway Steel Spring Co.	xvi
Safety Car Heating & Light'g Co.	xvi
Schaefer Equipment Co.	v
Sipe, James B., & Co.	iv
Standard Steel Car Co.	xviii
Steel Car Forge Co.	Front Cover
Stucki Co., A.	xix
Suydam, M. B. Co.	Back Cover
The T. H. Symington Co.	v
The Q & C Co.	xxii
Union Spring & Mfg. Co.	xiv
Union Steel Casting Co.	xix
United States Rubber Co.	xxi
U. S. Metallic Packing Co.	xvi
Vapor Car Heating Co., Inc.	xix
Westinghouse Air Brake Co.	vii
Westinghouse Electric & Mfg. Co.	vii

RAILWAY CLUB NOTES.

The following subjects were presented and discussed by the several Railway Clubs, during the month of October, 1919, as noted below:

New York Railroad Club, Harry D. Vought, Secretary,
95 Liberty Street, New York, N. Y.
SUBJECT—"Freight Car Utilization" by W. C. Kendall.

New England Railroad Club, Wm. E. Cade, Jr., Secretary,
683 Atlantic Avenue, Boston, Mass.
SUBJECT—Not received.

Richmond Railway Club, F. O. Robinson, Secretary,
Richmond, Va.
SUBJECT—Not received.

St. Louis Railway Club, B. W. Frauenthal, Secretary,
Union Station, St. Louis, Mo.
SUBJECT—"Can the Railroad Problem Be Solved" by W. T. Tyler, Director, Division of Operation, U. S. R. A. A., Washington, D. C.

Southern & Southwestern Railway Club, A. J. Merrill, Secretary,
Box 1205, Atlanta, Ga.
SUBJECT—Not received.

Central Railway Club, Buffalo, N. Y., Harry D. Vought, Secretary,
95 Liberty Street, New York, N. Y.
SUBJECT—Not received.

Canadian Railway Club, W. A. Booth, Secretary,
131 Charron Street, Montreal Canada.
SUBJECT—"Competition, Combination and Co-operation" by Major S. P. Robins, General Manager, The Dearborn Chemical Company of Canada.

Pacific Railway Club, Wm. S. Wollner, Secretary,
64 Pine Street, San Francisco, Cal.
SUBJECT—Not received.

Western Railway Club, A. F. Steubing, Secretary,
750 Transportation Building, Chicago, Ill.
SUBJECT—Not received.

The Railway Club of Pittsburgh, J. D. Conway, Secretary,
515 Grandview Avenue, Pittsburgh, Pa.
SUBJECT—"Annual Meeting and Smoker."

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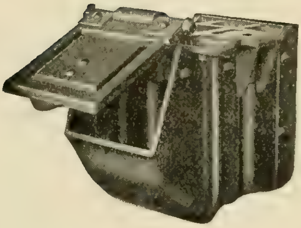

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OFFICIAL PROCEEDINGS

OF

The Railway Club of Pittsburgh

Organized October 18, 1901.

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No. 8.

Pittsburgh, Pa., Oct. 23, 1919

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OFFICERS FOR 1918-1919

President

J. A. SPIELMANN.
Asst. to Genl. Supt., B. & O. R. R.,
Pittsburgh, Pa.

First Vice President

FRANK J. LANAHAN,
President, Fort Pitt Mall. Iron Co.
Pittsburgh, Pa.

Second Vice President

SAMUEL LYNN
Master Car Builder, P. & L. E. R. R.,
McKees Rocks, Pa.

Secretary

J. D. CONWAY
Sec'y-Treas. Ry. Supply Mnfrs. Ass'n.,
Pittsburgh, Pa.

Treasurer

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Genl. Supt., Montour R. R.,
Coraopolis, Pa.

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L. H. TURNER, Supt. Motive Power, P. & L. E. R. R., Pittsburgh, Pa.
D. J. REDDING, Asst. Supt. Motive Power, P. & L. E. R. R., McKees Rocks, Pa.
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A. G. MITCHELL, Supt., West Jersey & Seashore R. R., Camden, N. J.
F. M. McNULTY, Supt. Motive Power, Monon. Conn. R. R., Pittsburgh, Pa.
J. G. CODE, Pittsburgh, Pa.
D. M. HOWE, Railway Supplies, Pittsburgh, Pa.

Finance Committee

E. C. SATTLEY, General Manager, Page Steel & Wire Co., Pittsburgh, Pa.
STEPHEN C. MASON, Secretary, The McConway & Torley Co., Pittsburgh, Pa.
CHAS. A. LINDSTROM, Asst. to President, Pressed Steel Car Co., Pittsburgh, Pa.
E. J. SEARLES, Schaefer Equipment Co., Pittsburgh, Pa.

Membership Committee.

A. STUCKI, Engineer, Pittsburgh, Pa.
C. O. DAMBACH, General Manager, Unity Railways, Pittsburgh, Pa.
P. F. SMITH, JR., Genl. Supt. M. P., Penna. Lines West, Pittsburgh, Pa.
B. E. D. STAFFORD, General Manager, Flannery Bolt Company, Pittsburgh, Pa.
HARRY C. GRAHAM, President, Graham Nut Co., Pittsburgh, Pa.
H. E. CHILCOAT, Manager, Clark Car Co.. Pittsburgh, Pa.
H. P. HOFFSTOT, President, Koppel Company, Pittsburgh, Pa.

Entertainment Committee.

D. H. AMSBARY, District Manager, Dearborn Chemical Co., Pittsburgh, Pa.
HARRY MURDOCH, President, H. Murdoch Co., Pittsburgh, Pa.
I. H. MILLIKEN, Representative, The McConway & Torley Co., Pittsburgh, Pa.

Past Presidents

J. H. McCONNELL	October, 1901, to October, 1903.
L. H. TURNER	November, 1903, to October, 1905.
F. H. STARK	November, 1905, to October, 1907.
* H. W. WATTS	November, 1907, to April, 1908.
D. J. REDDING	November, 1908, to October, 1910.
F. R. McFEATTERS	November, 1910, to October, 1912.
A. G. MITCHELL	November, 1912, to October, 1914.
F. M. McNULTY	November, 1914, to October, 1916.
J. G. CODE	November, 1916, to October, 1917
D. M. HOWE	November, 1917, to November, 1918.

* Deceased.

Meetings held fourth Thursday of each month, except June, July and August.

PROCEEDINGS OF ANNUAL MEETING, OCTOBER 23, 1919.

The meeting was called to order in the Americus Club House, Pittsburgh, Pa., at 8 o'clock, P. M., with President Spielmann in the chair.

The following gentlemen registered:

MEMBERS.

Adams, L.
Allan, W. J.
Allen, G. F.
Anderson, Harry T.
Arnold, J. G.
Aston, A. R.
Bailey, R. E. L.
Bain, W. J.
Barratt, R. D.
Batchelar, E. C.
Battenhouse, J. M.
Beach, Howard L.
Beals, Robert E.
Beattie, J. A.
Bell, R. P.
Boate, H. S.
Bonifield, C. P.
Booth, J. K.
Boring, T. J.
Bowden, T. C.
Bradley, W. C.
Brand, H. B.
Brann, W. S.
Braun, O. F.
Brower, J. E.
Burel, W. C.
Calvin, A. W.
Carroll, Frank E.
Charlton, W.
Christy, F. X.
Clark, C. C.
Cline, W. A.
Code, J. G.
Collins, W. H.
Conway, J. D.
Coumis, Gust
Courtney, D. C.
Crenner, J. A.
Crookston, W. G.
Cunningham, H. R.
Daly, P. J.
Dambach, C. O.
DeCoudres, R. B.
Dette, R. E.
Downs, J. J.
Dunn, James
Durant, C. H.
Durkin, Jas. E.
Easton, J. McF.
Emery, E.
Fairgrieve, E. N.
Fendner, W. J.
Finney, H. F.
Forrest, C. H.
Foster, John
Freshwater, F. H.
Frey, Albert R.
Fulton, A. M.
Gardner, K. C.
Geisler, Jos. J.
Gies, George E.
Gilg, Henry F.
Gobrecht, J. C.
Graham, J. H.
Grewe, H. F.
Gross, C. H.
Guay, John W.
Hale, Chas. E.
Hampson, Vance
Harris, J. P.
Harter, Arnold
Hatt, Harry J.
Haynes, John E.
Hazen, E. C.

Hepburn, M. J.
Higgins, H. L.
Hood, D. G.
Hornbeck, W. E.
Howe, D. M.
Huber, H. G.
Huchel, Wm. J.
Hughes, Jos. T.
James, Robert E.
Karnes, W. T.
Keagy, C. O.
Kelly, H. B.
Kelly, J. P.
Keptner, J. B.
Kinch, L. E.
Kindle, W. F.
King, C. F., Jr.
Kinter, D. H.
Kummer, Jos. H.
Kuns, L. R.
Lang, W. C.
Laurent, George F.
Lawson, A. F.
Lloyd, John A.
Long, H. P.
Lobez, P. L.
Laughner, C. L.
Lowe, W. D.
Lynn, Samuel
Lyons, Robt. S.
Mackert, A. A.
Maisch, Geo. J.
Matchett, H. K.
Mathison, J. E.
Meeker, H. B.
Merscher, John
Millar, C. W.
Miller, S. W.
Mitchell, J. W.
Morris, Jack M.
Murphy, E. S.
Myers, W. H.
McConn, G. E.
McConnell, P. L.
McDowell, D. W.
McGovern, Geo. J.
McGrann, E. Roy
McKinstry, C. H.
McMullen, Clark E.
McNamara, John V.
McNulty, F. M.
Nelson, W. O.
Newlin, C. E.
Nicodemus, E. H.
Nieman, H. L.
Nordenmalm, H.
Padfield, Archie
Painter, Joseph
Patterson, J. E.
Perry, W. E.
Pokorney, J. J.
Proven, John
Rankin, B. B.
Redding, D. J.
Reich, F. C.
Rhoads, G. A.
Rick, Robert C.
Riddile, F. C.
Ridley, R. C.
Ritts, W. H.
Robeck, George
Rowland, W. H.
Rowley, Chas. E.
Ruhling, J. V.
Schaaf, A. J.
Schaich, William L.
Scheck, H. G.
Searles, E. J.
Seibert, Wm. L.
Seubert, Harry J.
Severn, A. B.
Sheridan, Thos. F.
Shuck, Wm. C.
Simonson, S.
Smith, D. W.
Smith, F. C.
Smith, J. L.
Snyder, Joseph
Snyder, J. W.
Snyder, W. H.
Spielmann, J. A.
Sponsler, W. L.
Stauffer, A. H.
Stehl, E., Jr.
Stevenson, Wm.
Stofiel, L. W.

Stombaugh, J. C.
Strome, H. H.
Strople, G. H.
Strub, Harry G.
Stucki, A.
Styers, J. V.
Sutter, Chas.
Swift, W. G.
Tate, J. B.
Thomas, E. K.
Thomas, W. H.
Thompson, C. H.
Thurlby, A. R.
Townsend, J. F.
Uhler, J. Lloyd
Vowinkel, Fred F.
Ward, W. E.
Warner, E. O.
Wenell, K. O.
West, John W.
Williamson, J. A.
Wilson, D. L.
Wolf, H. M.
Woodside, S. P.
Wyke, J. W.
Yohe, J. B., Jr.

VISITORS.

Atkinson, J. W.
Allen, J. F.
Anderson, J. A.
Andrews, Guy L.
Biggs, James
Bell, Edwin H.
Berthold, G. B.
Bhomof, J. W.
Bower, L. P.
Bowery, Frank J.
Bowman, P. B.
Braaurd, K.
Brown, C. C.
Burke, J. F.
Christley, J. F.
Costin, J.
Courtney, A. B.
Darrah, C. B.
Dobrecan, Mike
Downing, Wm. T.
Duff, S. L.
Dunlevy, J. J.
Eberle, F. H.
Ekis, E. I.
Falkenstein, W. H.
Fox, A. B.
Gallagher, A. B.
Gilson, G. I.
Glaser, J. P.
Guttormsen, B.
Hammerstrome, R.
Hammond, J. H.
Harbaugh, J. P.
Harper, T. L.
Haussan, S.
Heineman, William L.
Hendrickson, S. D.
Henggi, Lewis O.
Herbst, Malcolm
Herrold, W. E.
Hughes, J. E.
Judge, Arthur L.
Kearns, R. C.
Keenen, J. W.
Krogh, F. F.
Lagergeen, R.
Leitch, R. A.
Lewis, M. M.
Long, Walter
Lynch, C. A.
Manser, John E.
Muya, James F.
Miller, H. H.
Moorhead, Charles G.
Murphy, W. J.
McCabe, C. P.
McClements, J. B.
McKnight, Wm.
McLaughlin, P. J.
McNair, F. W.
Nicholas, A. D.
Payne, H. A.
Penz, O. F.
Pettey, W. E.

Pickels, H. D.
Porter, H. V.
Pierrel, Chas.
Rigby, Albert V.
Ritz, G. R.
Roth, Philip J.
Rowley, C. J.
Rudd, W. B.
Salisbury, S. W.
Savage, Sgt. A. W.
Scranton, H. B.
Shannon, David E.
Shepler, W. H.
Shields, F. W.
Shiring, C. R.
Sindall, G. E. M.
Smith, Sion B.
Smythe, W. C.
Sowash, F. E.
Surrey, H. N.
Sutton, Roy R.
Trelfall, J. D.
Wagner, G. Ralph
Weil, Louis

The reading of the minutes of the last meeting was dispensed with, the Proceedings being in the hands of the printer.

The Secretary read the list of applications as follows:

Allen, G. F., Agent, Pittsburgh & West Virginia R. R., Fourth and Liberty Avenues, Pittsburgh, Pa. Recommended by C. O. Dambach.

Anderson, J. A., Assistant Superintendent of Shops, B. & O. R. R. Co., Glenwood, Pa. Recommended by W. C. Burel.

Baker, S. S., Superintendent, Clark Car Company, 1639 Oliver Building, Pittsburgh, Pa. Recommended by H. E. Chilcoat.

Brenthinger, C. W., C. C. to S. M. P., Pennsylvania R. R., 703 Chamber of Commerce Building, Pittsburgh, Pa. Recommended by C. R. Branson.

Brown, F. M., Superintendent, P. & L. E. R. R. Co., Pittsburgh, Pa. Recommended by D. J. Redding.

Burke, John F., Traffic Manager, American Spiral Spring & Manufacturing Co., Fifty-sixth Street and A. V. R. R., Pittsburgh, Pa. Recommended by Henry F. Gilg.

Chipps, J. L., Freight Clerk, Montour R. R., 1215 State Avenue, Coraopolis, Pa. Recommended by J. G. Arnold.

Christley, James F., Monongahela Connecting R. R., 5123 Center Avenue, Pittsburgh, Pa. Recommended by D. W. McDowell.

Church, C. C., Special Agent, Pittsburgh Coal Co., 54 Hodgson Avenue, Ingram, Pa. Recommended by W. P. Buffington.

Courtney, Austin B., Clerk, Montour R. R., 8 Market Street, Pittsburgh, Pa. Recommended by J. G. Arnold.

Covey, H. T., Secretary, The Cleveland Pneumatic Tool Co., 3734 East 78th Street, Cleveland, Ohio. Recommended by J. D. Conway.

Darrah, Charles B., Assistant Superintendent of Signals, P. R. R. Co., Monongahela Division, 2111 Sidney Street, S. S., Pittsburgh, Pa. Recommended by L. E. Kinch.

Devans, E. J., General Superintendent, B. R. & P. Railway, DuBois, Pa. Recommended by J. A. Spielmann.

Dyck, Walter E., Salesman, Felt & Tarrant Manufacturing Co., 155 Union Arcade, Pittsburgh, Pa. Recommended by F. C. Smith.

Flower, E. S., Storekeeper, P. & L. E. R. R. Co., Storehouse "A", McKees Rocks, Pa. Recommended by J. C. Gobrecht.

Fox, A. B., Assistant Superintendent, Westinghouse Air Brake Co., 329 Margurette Avenue, Wilmerding, Pa. Recommended by F. E. Carroll.

Jeffries, Harry B., Freight Agent, B. & O. R. R. Co., Washington, Pa. Recommended by J. A. Spielmann.

Keenen, J. W., Assistant Road F. E., P. R. R. Co., 705 North Highland Avenue, Pittsburgh, Pa. Recommended by J. J. Downs.

King, J. W., Jr., Chief Clerk to Traffic Manager, Pittsburgh Coal Co., 1024 Oliver Building, Pittsburgh, Pa. Recommended by W. P. Buffington.

Klingel, M. P., General Clerk, P. R. R. Western Lines, 703 Chamber of Commerce, Pittsburgh, Pa. Recommended by C. R. Branson.

Kochlinger, C. W. H., Mechanical Inspector, P. R. R. Western Lines, 703 Chamber of Commerce, Pittsburgh, Pa. Recommended by C. R. Branson.

Lamb, W. J., Assistant C. C. Stores Department, P. & L. E. R. R. Co., 219 Grandview Avenue, Mt. Washington, Pittsburgh, Pa. Recommended by J. C. Gobrecht.

Manning, R. E., Manager, Cleveland Pneumatic Tool Co., 922 Farmers Bank Building, Pittsburgh, Pa. Recommended by J. D. Conway.

Martin, Joseph H., Assistant Yard Master, P. & L. E. R. R. Co., 413 Alexander Street, McKees Rocks, Pa. Recommended by William Lynn.

Mateer, Wm. M., Assistant Storekeeper, P. & L. E. R. R. Co., 1176 Dohrman Street, McKees Rocks, Pa. Recommended by J. C. Gobrecht.

Munn, Alex D., Clerk, General S. K. Office, P. & L. E. R. R. Co., Glenwillard, Pa. Recommended by J. C. Gobrecht.

Parker, W. D., Assistant Auditor, Montour R. R., 6841 Frankstown Avenue, Pittsburgh, Pa. Recommended by J. G. Arnold.

Partington, Joshua A., Inspector, American Arch Co., Franklin Railway Supply Co., 225 Cornell Avenue, West View, Pittsburgh, Pa. Recommended by J. D. Conway.

Roth, Philipp J., General Car Foreman, Montour R. R., Coraopolis, Pa. Recommended by Walter H. Myers.

Rowland, W. H., Representative, P. C. C. & St. Louis Railway, 617 Bellefonte Street, Pittsburgh, Pa. Recommended by J. J. Downs.

Rudd, W. B., Assistant M. M., Monongahela Division, Penna. R. R., 5530 Baum Boulevard, Pittsburgh, Pa. Recommended by H. G. Huber.

Salisbury, S. W., Clerk, P. & L. E. R. R. Co., 3310 West Liberty Avenue, South Hills Branch, Pittsburgh, Pa. Recommended by A. F. Lawson.

Scharpf, R. E., P. & L. E. R. R. Co., (P. O. Box 218), Glenwillard, Pa. Recommended by J. C. Gobrecht.

Stokes, A. H., Assistant Supt., B. R. & P. R. R., Punxsutawney, Pa. Recommended by J. A. Spielmann.

Sutherland, Lloyd, Clerk, P. & L. E. R. R. Co., 227 Radcliffe Street, Pittsburgh, Pa. Recommended by J. C. Gobrecht.

Trelfall, J. D., Freight Agent, P. & L. E. R. R. Co., 27 Oregon Avenue, Crafton, Pa. Recommended by J. B. Yohe, Jr.

White, A. B., Superintendent, B. R. & P. Railway, DuBois, Pa.
Recommended by J. A. Spielmann.

PRESIDENT: As soon as these applications have been favorably acted on by the Executive Committee the applicants will become members without further action than the payment of one year's dues.

PRESIDENT SPIELMANN: This is the meeting at which we install a new president and fire the old one. We will listen to a report of the election from the Tellers.

SECRETARY: The result of the election, as reported by the Tellers, is as follows:

PRESIDENT—Col. H. H. Maxfield.

FIRST VICE PRESIDENT—Frank J. Lanahan.

SECOND VICE PRESIDENT—Samuel Lynn.

TREASURER—F. H. Stark.

SECRETARY—J. D. Conway.

EXECUTIVE COMMITTEE—L. H. Turner, D. J. Redding, F. R. McFeatters, A. G. Mitchell, F. M. McNulty, J. G. Code, D. M. Howe, J. A. Spielmann.

FINANCE COMMITTEE—E. C. Sattley, Chas. A. Lindstrom, E. J. Searles, George W. Wildin, J. F. Townsend.

MEMBERSHIP COMMITTEE—A. Stucki, C. O. Dombach, H. E. Chilcoat, J. A. Ralston, M. R. Reed, J. L. Cunningham, W. G. Burel.

ENTERTAINMENT COMMITTEE—D. H. Amsbary, Harry Murdock, Henry F. Gilg.

PRESIDENT: Our Treasurer, Mr. F. H. Stark, is very unfortunate in being unable to be present this evening. The formal report of the Treasurer will appear in the Proceedings. The substance of it is included in the report of the Secretary, to which we will now listen.

SECRETARY'S REPORT

Pittsburgh, Pa., October 23, 1919.

To the Officers and Members of
The Railway Club of Pittsburgh.

Gentlemen:

The following is a summary of membership and financial statement for the period from November 21st, 1918, the date of our last Annual Meeting, up to date of this meeting, October 23rd, 1919:

MEMBERSHIP

Reported last year	859	
Received into membership during the year	381	
Reinstated	2	
		1242
Suspended, non-payment of dues	57	
Resigned	33	
Loss of address	16	
Dropped not eligible	1	
Died	6	
		113
Present Membership		1129

Net increase in membership during the year 270, of the above membership 9 are Honorary.

Names of deceased members:

T. W. Barrett, J. W. Henderson, H. H. Hilberry, W. T. Hogan, Walter V. Turner, L. L. Wolfe.

FINANCIAL

Receipts

In hands of Treasurer November 21, 1918	$4,051	00
From dues	2,527	10
From advertising	1,244	00
From sale of tickets, smoker Nov. 21, 1918	201	00
From Alvin, tickets, "Leave it to Jane"	408	65
From souvenir program, "Leave it to Jane"	2,825	00

From sale of Proceedings	8 25	
From interest on Liberty Bonds, etc	160 73	
Total Receipts		$11,425 73

DISBURSEMENTS

Printing Proceedings, Notices, Mailing, etc	$1,683 70	
Hall, Luncheons, Cigars, etc., for meetings	554 59	
Reporting Proceedings of meetings	135 00	
Salary of Secretary & advertising expenses	724 40	
Messenger service	22 00	
Interest on Demand Note of $600.00	36 50	
Luncheon, Entertainment, etc., Smoker, November, 1918	289 80	
Moving Pictures	80 60	
Stationery, Postage and supplies	312 27	
Premium on Bonds, Treasurer and Sec'y	15 05	
Society Railway Club Secretaries	15 00	
Making half tones	36 27	
Alvin Theatre for tickets, April 22, 1919	562 11	
Printing programs and other expense, "Leave it to Jane"	1,140 91	
Total Disbursements		$ 5,608 20
Net Balance		$ 5,817 53

NOTE—Accrued liability demand note of $600.00, which is secured by our Liberty Bond of $1,000.00.

Cash is made up of $2,817.53 and $3,000.00 in Liberty Bonds.

J. D. CONWAY, *Secretary.*

Approved:

L. H. TURNER, *Chairman*

D. J. REDDING,	F. M. MCNULTY,
F. R. MCFEATTERS,	J. G. CODE,
A. G. MITCHELL,	D. M. HOWE.

Executive Committee.

TREASURER'S REPORT

Pittsburgh, Pa., October 23, 1919.

To the Officers and Members of
The Railway Club of Pittsburgh.

GENTLEMEN:

I hereby submit Treasurer's Report for year ended October 23rd, 1919:

ON HAND AND RECEIPTS

Three Librety Bonds, $1,000.00 each	$3,000 00	
Cash on hand November 21st, 1918	1,051 00	
Total on hand November 21st, 1918		$ 4,051 00
Received from Secretary during year		7,374 73
Total		$11,425 73

DISBURSEMENTS

Paid on Secretary's Vouchers	$ 5,608 20
Balance on hand October 23rd, 1919	$ 5,817 53

RESOURCES

Three Liberty Bonds ($1,000.00 each)	$3,000 00	
Cash in Bank	2,817 53	
Total		$ 5,817 53

NOTES—Accrued liability demand note of $600.00, which is secured by our Liberty Bond of $1,000.00.

F. H. STARK, *Treasurer.*

Approved:

L. H. TURNER, *Chairman*

D. J. REDDING,
F. R. MCFEATTERS,
A. G. MITCHELL,
F. M. MCNULTY,
J. G. CODE,
D. M. HOWE.
Executive Committee.

PRESIDENT: Next in order is the report of the Membership Committee, which will be presented by its Chairman, Mr. A. Stucki.

To the President and the Members
of The Railway Club of Pittsburgh:

Our Secretary just told us that we had 1131 members. Considering that this is one of the youngest clubs in the country, it is certainly a healthy child. It may be interesting to some of us to see how the members are distributed amongst the different railroads. The list is as follows:

P. R. R.	137	Montour R. R.	8
P. & L. E.	121	W. & L. E.	7
B. & O.	115	McKeesport Con.	6
Penna. Lines	51	P. & W. Va.	5
Union R. R.	38	P. A. & McK.	4
B. & L. E.	27	A. & S.	3
Mon. Con.	15	N. S. W. Gov. Ry.	2
Mon. Railway	15	22 with 1	22
N. Y. C.	2		
Wash. Run	2	Total	580

Most of the other members are connected with the manufacture and sales of railroad material, such as Air Brakes, Electrical Apparatus, or other special devices. Some of them are connected with engineering or research work for the government, our universities and private concerns; some are managing and editing our various railroad journals, while many others, take care of traffic and railroad matters for the various mills and warehouses.

Your Committee had six meetings during the year either at the Duquesne Club, Chamber of Commerce or the Traffic Club, and I, as Chairman, in behalf of the whole Committee, wish to take this opportunity to thank our President for his great and enthusiastic help. We also thank him and the Secretary for honoring us at our meetings with their presence, likewise the Executive Committee for their kindness and interest in attending one of our meetings.

As a matter of just temporary interest, it may be mentioned that the above figures include 37 new members, who have made application for membership between November 1918 and

May 1919 and who were passed at that time by the Executive Committee, but have not paid their first dues, although the Secretary sent them two notices and finally a personal letter. We feel that these matters were simply overlooked and hope that everything will be straightened out by Novmber 1st. The dues of 10 applicants after May 19th will no doubt also receive proper attention tonight or soon after.

We believe in an orderly systematic method of inviting every one eligible to become a member and for this purpose subdivided the whole field amongst the different committee members, so that nobody will be overlooked and so that the work is not duplicated.

Our membership is not as large as it should be considering the railroad interests represented in this section, but we are gaining gradually and with the help of all and everyone of us next year, no doubt, will show up still better than the last.

Respectfully yours,

A. STUCKI,
Chairman of Membership Committee.

PRESIDENT: I wish to compliment the Membership Committee for the lively interest they have taken and the help they have given your President during the past year. They are a good live bunch.

We have another good live bunch, that we call the Entertainment Committee. We would like to hear a short report from Mr. Amsbary, the Chairman of that Committee.

MR. D. H. AMSBARY: I was just figuring over today the length of time I have been in Pittsburgh, and I find I have been here about eleven years. And the greatest pleasure I have had in this time has been my membership on the Entertainment Committee of the Railway Club of Pittsburgh. It has been a great pleasure to me to do anything for the Railway Club. We have been successful to a certain extent in the past. We have a little show tonight that we think will be pleasing to every one, and we hope you will not go home mad. I do not know that I have anything much to say, but will let the results speak for the Committee.

PRESIDENT: Are there any communications?

I believe there is no unfinished business. Mr. Amsbary, of the Entertainment Committee, said he had some "wild women" to run in on the stage this evening, and we will turn the further programme of the evening over to him.

MR. D. J. REDDING: Mr. President, before you call on the Entertainment Committee, I have a few words to say to you. You have been a very sucessful president of the Railway Club for the past year. We all take off our hats to you for having brought in more new members than any other individual member of the Club. We hope you are not going to cease your activities. We hope you will bring in a lot more during the coming year, whether you are president or not.

We are not so sure as to what your past habits have been in the matter of use of beverages of various kinds, but since July 1st has come, we know that you are going to be limited in your selection of beverages, and so we thought we would give you something you could utilize for the best known, present day liquid refreshments, therefore, we secured this outfit, which will amply provide for all of your tea and coffee requirements.

Will you kindly accept these little articles, with the grateful appreciation of the Club for your very strenuous and successful efforts during the past year.

Mr. Redding then presented to the retiring President, on behalf of the Club, an exquisite solid silver tea service and tray.

PRESIDENT SPIELMANN: Fellow members and officers of the Club: This is rather a surprise. While I have spent a good deal of time and energy in the interest of the Club, and started out to accomplish three things, I think I may fairly say that I accomplished two of them, though I fell down on the third.

In the first place I did not like the place we met in before, and succeeded in getting the Club in this place, which seems to me to be a decided improvement. Then I wanted to increase the membership of the Club to fifteen hundred, and it could have been done with the help of all the members. I said that I would bring in fifty new members if each member of the Club would bring in one. I kept my part of it. To put the Club on a sound financial basis was the third thing, and I believe there need be no fear in that respect for the coming year.

I want to say that the last year, because of the meetings of the Club and my connection with it, has been one of the happiest years of my life. I enjoyed the meetings, I enjoyed the associations with the railroad men and railway supply men. It has been an excellent place where you could get good fellowship. And it has been a place where one can learn a great deal. Our addresses have been remarkably good. Only last week I got a request from a party in Washington who wanted especially a copy of one of our papers. He wanted a file of our Proceedings to get at the matter of that paper, on "Safety First." If you turn back to the February number, I believe it was, you will find one of the best articles on Safety First that you can run across. That was an address given in this room. I have had requests for others, and the Secretary has had requests for a number of others. It is quite a task to get good speakers to talk on subjects that are interesting to all our membership. But the well is not dry yet. There are a lot more who can be had.

The importance of this Club as a meeting place for men who work in every phase of railroad activity can not be too much emphasized. I believe we do not realize just what this Club may mean to the future welfare of our whole Country. There is growing a wider and wider breach between classes, class feeling is being emphasized and the struggle of class against class for advancement regardless of its effect on others is reaching a crisis. This feeling is not natural to free America, it does not accord with the ideals of true American manhood, and it clashes with that spirit of brotherhood which lies at the very foundation of our American institutions. We are in danger in this country. The thing we need is a better knowledge of each other, a better acquaintance with the conditions that surround the other fellow. And there is no better place and there are no more favorable conditions to be found for gaining a true understanding of the many intricate and perplexing problems of the railroads than right here on this floor, where yard men and general managers, engineers and office clerks, all classes in all lines of work, meet on a common level, free from mutual suspicions, and in a spirit of good fellowship that breeds frankness. And the loyal, patriotic American can be depended upon to do the right thing when once he knows it and is left free to act. Gentlemen, I believe that this Club, and organizations like it, may yet be the salvation of our country.

I wish to say that I appreciate very highly this token of your friendship and regard. I shall always keep it where it can be seen and put it in use. And I invite all of you to my house, and I will let you drink out of the coffee pot, or tea pot, whichever you wish. And I shall have sugar in the bowl, too.

I want to thank you again for your kindness, and to assure you that I will not let up in my endeavors to get this Club up to 1500 members. It is surely coming. The possibilities of this Railway Club are beyond our conception. There must come a time in Pittsburgh as well as in other places where we have an open forum.

I know all the gray headed members are anxiously awaiting the "wild women," so we will turn the meeting over to Mr. Amsbary at once.

A highly entertaining musical programme followed, after which luncheon was served in the dining hall.

J. D. CONWAY, *Secretary.*

The Railway Club of Pittsburgh

CONSTITUTION

ARTICLE I.

The name of this organization shall be "The Railway Club of Pittsburgh."

ARTICLE II.

OBJECTS

The objects of this Club shall be mutual intercourse for the acquirement of knowledge, by reports and discussion, for the improvement of railway operation, construction, maintenance and equipment, and to bring into closer relationship men employed in railway work and kindred interests.

ARTICLE III.

MEMBERSHIP

Section 1. The membership of this Club shall consist of persons interested in any department of railway service or kindred interests, or persons recommended by the Executive Committee upon the payment of the annual dues for the current year, or such proportion as corresponds to the unexpired portion of that year, on a quarterly basis.

Sec. 2. Persons may become honorary members of this Club by a unanimous vote of all members present at any of its regular meetings, and shall be entitled to all the privileges of membership and not be subject to the payment of dues or assessments.

ARTICLE IV.

OFFICERS

The officers of this Club shall consist of a President, First Vice-President, Second Vice-President, Secretary, Treasurer, Finance Committee consisting of five members, Membership Committee consisting of seven members, Entertainment Committee consisting of three members, and an Elective Executive

Committee of three or more members who shall serve a term of one year from the date of their election, unless a vacancy occurs, in which case a successor shall be elected to fill the unexpired term.

ARTICLE V.

DUTIES OF OFFICERS

SECTION 1. The President shall preside at all regular or special meetings of the Club and perform all duties pertaining to a presiding officer; also serve as a mmeber of the Executive Committee.

SEC. 2. The First Vice-President, in the absence of the President, will perform all the duties of that officer; the Second Vice-President, in the absence of the President and First Vice-President, will perform the duties of the presiding officer. The First and Second Vice-President shall also serve as members of the Executive Committee.

SEC. 3. The Secretary will attend all meetings of the Club or Executive Committee, keep full minutes of their proceedings, preserve the records and documents of the Club, accept and turn over all moneys received to the Treasurer at least once a month, draw cheques for all bills presented when approved by a majority of the Executive Committee present at any meetings of the Club, or Executive Committee meeting. He shall have charge of the publication of the Club Proceedings and perform other routine work pertaining to the business affairs of the Club under the direction of the Executive Committee.

SEC. 4. The Traesurer shall receipt for all moneys received from the Secretary, and deposit the same in the name of the Club within thirty days in a bank approved by the Executive Committee. All disbursements of the funds of the Club shall be by cheque signed by the Secretary and Treasurer.

SEC. 5. The Executive Committee will exercise a general supervision over the affairs of the Club and authorize all expenditures of its funds. The elective members of this Committee shall also perform the duties of an auditing committee to audit the accounts of the Club at the close of a term or at any time necessary to do so.

SEC. 6. The Finance Committee will have general supervision over the finances of the Club, and perform such duties as may be assigned them by the President or First and Second Vice-Presidents.

Sec. 7. The Membership Committee will perform such duties as may be assgned them by the President or First and Second Vice-Presidents, and such other duties as may be proper for such a committee.

Sec. 8. The Entertainment Committee will perform such duties as may be assigned them by the President or First and Second Vice-Presidents and such other duties as may be proper for such a committee.

ARTICLE VI.

ELECTION OF OFFICERS

Section 1. The officers shall be elected at the regular annual meeting as follows, except as otherwise provided for:

Sec. 2. Printed forms will be mailed to all the members of the Club, not less than twenty days previous to the annual meeting, by the elective members of the Executive Committee. These forms shall provide a method, so that each member may express his choice for the several offices to be filled.

Sec. 3. The elective members of the Executive Committee will present to the President the names of the members receiving the highest number of votes for each office, together with the number of votes received.

Sec. 4. The President will announce the result of the ballot and declare the election.

Sec. 5. Should two or more members receive the same number of votes, it shall be decided by a vote of the members present, by ballot.

ARTICLE VII.

AMENDMENTS.

Amendments may be made to this Constitution by written request of ten members, presented at a regular meeting and decided by a two-thirds vote of the members present at the next regular meeting.

BY-LAWS

ARTICLE I.

MEETINGS

SECTION 1. The regular meetings of the Club shall be held at Pittsburgh, Pa., on the fourth Thursday of each month, except June, July and August, at 8 o'clock P. M.

SEC. 2. The annual meeting shall be held on the fourth Thursday of October each year.

SEC. 3. The President may, at such times as he deems expedient, or upon request of a quorum, call special meetings.

ARTICLE II.

QUORUM

At any regular or special meeting nine members shall constitute a quorum.

ARTICLE III.

DUES

SECTION 1. The annual dues of members shall be Two Dollars, payable in advance on or before the fourth Thursday of September each year. Provided, that new members shall only be required to pay such proportion of said dues, and subscription for the printed proceedings, for the current year as corresponds to the unexpired portion of that year, on a quarterly basis.

SEC. 2. The annual subscription to the printed proceedings of the Club shall be at the published price of One Dollar.

SEC. 3. At the annual meeting members whose dues are unpaid shall be dropped from the roll after due notice mailed them at least thirty days previous.

SEC. 4. Members suspended for non-payment of dues shall not be reinstated until all arrearages have been paid.

ARTICLE IV.

ORDER OF BUSINESS

1—Roll call.
2—Reading of the minutes.
3—Announcements of new members.
4—Reports of Committees.
5—Communications, notices, etc.
6—Unfinished business.
7—New business.
8—Recess.
9—Discussion of subjects presented at previous meeting.
10—Appointment of committees.
11—Election of officers.
12—Announcements.
13—Financial reports or statements.
14—Adjournment.

ARTICLE V.

SUBJECTS—PUBLICATIONS

SECTION 1. The Executive Committee will provide the papers or matter for discussion at each regular meeting.

SEC. 2. The proceedings or such portion as the Executive Committee may approve shall be published (standard size, 6x9 inches), and mailed to the members of the Club or other similar clubs with which exchange is made.

ARTICLE VI.

The stenographic report of the meetings will be confined to resolutions, motions and discussions of papers unless otherwise directed by the presiding officer.

ARTICLE VII.

AMENDMENTS

These By-Laws may be amended by written request of ten members, presented at a regular meeting, and a two-thirds vote of the members present at the next meeting.

MEMBERS

Adams, Lewis,
Clerk, P. S. C. Co.,
4004 Northminster Ave.,
N. S., Pitstburgh, Pa.

Aiken, Glen A.,
Vice-Pres., Sales Mgr.,
American Nut and Bolt
Fastener Co.,
Ontario and Doerr Sts.,
Pittsburgh, Pa.

Alexander, J. R.,
Gen'l R. F. of E.,
Pennsylvania R. R. Co.,
Altoona, Pa.

Allan, W. J.,
Sec. and Treas., Commissary
Co. of America,
1665 New Haven Ave.,
Pittsburg, Pa.

Alleman, C. W.,
General Storekeeper,
P. & L. E. R. R. Co.,
McKees Rocks, Pa.

Allen, G. F.,
Agent, Pgh. & W. Va. R. R.
4th & Liberty Aves.,
Pittsburgh, Pa.

Allen, Harry,
Ass't. Train Master,
B. & O. R. R. Co.,
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Hazelwood, Pa.

Allen, Howard L.,
Traveling Fireman,
P. & L. E. R. R.,
764 Mary St.,
McKees Rocks, Pa.

Allen, Jas. P.,
President,
Union Steel Castings Co.,
62nd and Butler Sts.,
Pittsburgh, Pa.

Allison, F. H.,
Audior.
American Vanadium Co.,
Vanadium Building,
Pittsburgh, Pa.

Allison, John,
Chief Engineer,
Pittsburgh Steel Fdy. Co.,
Glassport, Pa.

Amman, W. F.,
Ass't. Purchasing Agent,
Mon. Connecting R. R. Co.,
209 Moye St.,
Mt. Oliver, Pa.

Ansbary, D. H.,
District Manager, Dearborn
Chemical Co.,
Farmers Bank Bldg.,
Pittsburgh, Pa.

Anderson, A. E.,
President and Counsel,
Pgh. Dist. R. R. Co.,
1020 Bessemer Bldg.,
Pittsburgh, Pa.

Anderson, H. T.,
Chief Draftsman,
Freight Car Dept.,
Standard Steel Car Co.,
Butler, Pa.

Anderson, J. A.,
Asst. Supt. of Shops,
B. & O. R. R. Co.,
Glenwood, Pa.

Anderson, J. P.,
Chief Draftsman,
P. S. Car Co.,
Farmers Bank Bldg.,
Pittsburgh, Pa.

Angell, C. P.,
Ass't. Supt.,
B. & O. R. R. Co.,
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Wilkinsburg, Pa.

Anger, C. E.,
Upholster, P. & L. E. R. R.,
747 Boquet St.,
McKees Rocks, Pa.

Antes, Edwin L.,
Foreman Elect. Dept.,
Pressed Steel Car Co.,
40 McKinney Ave.,
McKees Rocks, Pa.

Anthony, J. T.,
Vice President,
American Arch Co.,
30 Church St.,
New York, N. Y.

Appelbe, John M.,
Gen. For., B. & O. R. R. Co.,
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Pittsburgh, Pa.

Arensberg, F. L.,
President,
Vesuvius Crucible Co.,
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Swissvale, Pa.

Armstrong, J. C.,
Supt. Telegraph, P. R. R.,
Broad St. Station,
Philadelphia, Pa.

Armstrong, J. L.,
Foreman Power Plants,
Penna. Lines,
1241 Columbus Ave.,
N. S., Pittsburgh, Pa.

Arnold, J. G.,
Car Service Clerk,
Montour R. R.,
8 Market St.,
Pittsburgh, Pa.

Arnold, J. J.,
Sales Dept., P. S. C. Co.,
Farmers Bank Bldg.,
Pittsburgh, Pa.

Ashworth, Wm.,
Sales Mgr., Johnson-Morehouse & Dickey Co.,
106 Market St.,
Pittsburgh, Pa.

Aston, A. R.,
Ass't. to Chief Engineer,
Mon. Connecting R. R. Co.,
Kennedy Ave.,
Duquesne, Pa.

Atterbury, W. W.,
V. P., P. R. R. Co.,
Broad St. Sta.,
Philadelphia, Pa.

Austin, Walter C.,
Traffic Manager,
Carbon Steel Co.,
P. O. Box 1591,
Pittsburgh, Pa.

Ayers, H. B.,
Gen. Mgr., H. K. Porter Co.,
49th St. and A. V. Ry.,
Pittsburgh, Pa.

Ayres, W. C.,
Foreman Car Dept.,
P. C. C. & St. L. Ry.,
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Carnegie, Pa.

Babcock, F. H.,
Safety Agent,
P. & L. E. R. R.,
63 Terminal Annex,
Pittsburgh, Pa.

Bail, Cail W.,
Asst Fore, Penna Lines West
Ft. Wayne Shops,
N. S., Pittsburgh, Pa.

Bailey, F. G.,
Chief Draftsman,
Motor Truck Dept.,
Standard Steel Car Co.,
Butler, Pa.

Bailey, J. A.,
Clerk, B. & L. E. R. R. Co.,
2021 Delaware Ave.,
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Bailey, R. E. L.,
Sec'y., American Spiral
Spring and Mfg. Co.,
56th and Butler Sts.,
Pittsburgh, Pa.

Bain, W. J.,
Shipper, Universal
Portland Cement Co.,
Universal, Pa.

Baird, F. C.,
Vice-President,
Montour R. R.,
709 Oliver Bldg.,
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Baker, George T.,
Genl Car Insp'r, P. R. R.,
Altoona, Pa.

Baker, S. S.,
Supt., Clark Car Co.,
1639 Oliver Bldg.,
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Bakewell, Donald C.,
President, Duquesne Steel
Foundry Company,
Farmers Bank Bldg.,
Pittsburgh, Pa.

Ball, Geo. L.,
Treasurer,
Ball Chemical Co.,
230 S. Fairmont Ave.,
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Ball, Wendell P.,
Asst. Div. Engineer,
B. & O. R. R.,
New Castle Jct., Pa.

Barnett, Geo.,
Special Rep.,
W. W. Lawrence & Co.,
Pittsburgh, Pa.

Barney, Harry,
Secretary and Treasurer,
Laughlin-Barney Mach. Co.,
Union Arcade,
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Barnhart, B. F.,
Acting R. F. of E.,
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410 Union Arcade,
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Barratt, R. D.,
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Monongahela R. R. Co.,
1513 Sheridan Ave.,
S. Brownsville, Pa.

Bartholomew, W. S.,
V. P., W. A. B. Co.,
Wilmerding, Pa.

Basford, G. M.,
President, Locomotive Feed
Water Heater Co.,
30 Church St.,
New York, N. Y.

Batchelar, E. C.,
Manager, The Motch &
Merryweather Mach'y Co.,
Farmers Bank Bldg.,
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Bateman, W. H. S.,
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Parkersburg Iron Co.,
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Trust Building,
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Battenhouse, John,
Inspector, W. A. B. Co.,
670 A Middle Ave.,
Wilmerding, Pa.

Batty, John,
Boiler Inspector,
Fidelity and Casualty Co.,
11 Buffalo St.,
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Beach, Howard L.,
Sales Engr., Clark Car Co.,
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Beals, Robert E.,
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Bean, Wm. H.,
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McKeesport Con. R. R.,
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Pittsburgh, Pa.

Beegle, R. B.,
Conductor, B. & O. R. R.,
210 Elizabeth St.,
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Beers, W. E.,
Pipefitter, P. & L. E. R. R.,
Dickerson Run, Pa.

Bell, R. P.,
Chief Clerk to M. C. B.,
P. & L. E. R. R.,
McKees Rocks, Pa.

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Vice Pres't., Pittsburgh
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Bennett, Robert George,
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Pgh. Div., P. R. R. Co.,
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Blair, Harry A.,
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Blakely, W. W.,
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Blakely, T. M.,
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Bloom, Edward B.,
Rep. Goldschmidt
Thermit Co.,
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Chicago, Ill.

Boate, H. S.,
P. W. Inspector,
P. & L. E. R. R.,
323 Russelwood Ave.,
McKees Rocks, Pa.

Boder, Jas. F.,,
Air Brake Repairman,
Penna. Lines West,
609 River Road,
Avalon, Pa.

Bole, Robert A.,
Manager, Manning,
Maxwell & Moore,
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Bond, W. W.,
Asst. Road Foreman of
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Bonifield, Chas. P.,
Car Fore., B. & O. R. R.,
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Hazelwood,
Pittsburgh, Pa.

Booth. J. K.,
Master Mechanic,
B. & L. E. R. R.,
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Boring, T. J.,
General Foreman,
M. C. B. Clearing House,
P. R. R.,
Altoona, Pa.

Bosley, N. D.,
Machinist, P. & L. E. R. R.,
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Bottomly, E. S.,
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Supv'r., Train Operations,
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Confluence, Pa.

Boughton. G. E.,
David Lupton Co.,
Cleveland, O.

Bowden, T. C.,
Coal Inspector,
B. & L. E. R. R.,
Greenville, Pa.

Bowers, John M.,
Clerk, Union R. R. Co.,
601 N. Beatty St.,
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Bowes, W. E.,
Act'g Asst. M. M. P. R. R.,
28th St. & Liberty Ave
Pittsburgh, Pa.

Bowmaster, J. W.,
Machinist, P. & L. E. R. R.,
Woods St.,
Lowellville, Ohio

Boyd, Martin,
Work Inspector, Penna.
Lines West,
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N. S., Pittsburgh, Pa.

Boyer, Chas. E.,
General Car Inspector,
P. R. R. Co.,
Room 204 Penna. Sta.,
Pittsburgh, Pa.

Boyer, F. A.,
Weldcraft Equipment Co.,
701 House Building,
Pittsburgh, Pa.

Boyer, John B.,
Foreman Loading Dept.,
Bethlehem Steel Co.,
221 Walnut St.,
Steelton, Pa.

Bradley, W. C.,
C. C. to Gen'l. Supt.,
Union R. R.,
1808 Lafayette St.,
Swissvale, Pa.

Brady, Daniel M.,
President, Brady Brass Co.,
95 Liberty St.,
New York, N. Y.

Brand, H. B.,
Sup't. Boilers,
Mesta Machine Co.,
637 Seventh Ave.,
Homestead, Pa.

Brandt, W. L.,
Machinist, P. R. R.,
406 Charles St.,
Knoxville, Pa.

Brann, W. S.,
Superintendent Coal Docks,
Union R. R.,
Duquesne, Pa.

Branson, Craig R.,
Mechanical Inspector,
Penna R R Western Lines,
703 Chamber of Commerce
Pittsburgh, Pa.

Brant, Wm. J.,
Wm. J. Brant,
1001 Bessemer Bldg.,
Pittsburgh, Pa.

Brashear, Dr. John A.,
1954 Perrysville Ave.,
N. S., Pittsburgh, Pa.

Braun, Otto F.,
Foreman, Machine Shop,
P. & L. E. R. R.,
414 Russellwood Ave.,
McKees Rocks, Pa.

Breen, J.,
Foreman, B. & O. R. R.,
214 Courtland St.,
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Gang Fore., P. & L. E. R. R.
Car Department,
801 Russellwood Ave.,
McKees Rocks, Pa.

Zipf, C. S,
Asst Foreman, Duquesne
Steel Foundry,
906 Fifth Ave.,
Coraopolis, Pa.

Zunic, Jos. H.,
Clerk, P. R. R. Co.,
74 Warren St.,
Pittsburgh, Pa.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912.

Official Proceedings Railway Club of Pittsburgh, nine issues, at Pittsburgh, Pennsylvania, for October 1st, 1919.

State of Pennsylvania,
County of Allegheny, } *ss.*

Before me, a Notary Public in and for the State and county aforesaid, personally appeared J. D. Conway, who, having been duly sworn according to law, deposes and says that he is the Secretary of the Official Proceedings Railway Club of Pittsburgh, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations.

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher Official Proceedings Railway Club of Pittsburgh, 515 Grandview Avenue, Pittsburgh, Pa.

Editor, J. D. Conway, 515 Grandview Avenue, Pittsburgh, Pa.

Managing Editor, J. D. Conway, 515 Grandview Avenue, Pittsburgh, Pa.

Business Manager, J. D. Conway, 515 Grandview Avenue, Pittsburgh, Pa.

2. That the owners are:

President, J. A. Spielmann, Pittsburgh, Pa.

Vice-President, Frank J. Lanahan, Pittsburgh, Pa.

Secretary, J. D. Conway, Pittsburgh, Pa.

Treasurer, F. H. Stark, Coraopolis, Pa.

3. That the known bondholders, mortgagees, and other

security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are:

President, J. A. Spielmann, Pittsburgh, Pa.

Vice-President, Frank J. Lanahan, Pittsburgh, Pa.

Secretary, J. D. Conway, Pittsburgh, Pa.

Treasurer, F. H. Stark, Coraopolis, Pa.

J. D. CONWAY.

Sworn to and subscribed before me this 4th day of October, 1919.

SUE B. FRITZ,
Notary Public.

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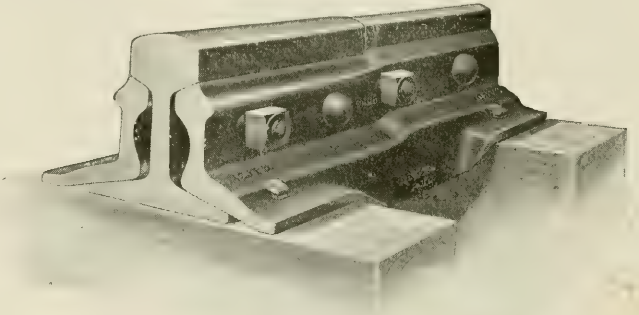

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